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ABSTRACT

OBJECTIVES: To provide a matrix of factual information based on research and expert opinion, provide a variety of experiences, provide opportunities for the demonstration of specific techniques, and disseminate findings to the technical education community. DURATION: Summer Institute, August 17 - August 28, 1970; Follow-up Program, August 29, 1970 - January 31, 1971. AUDIENCE: Community college engineering technology faculty, 18 male, 2 female. CURRICULUM: Understanding the backgrounds, problems, viewpoints, and aspirations of black and Puerto Rican students, ghetto communities and community agencies, and teacher attitudes. TEACHING METHODS: Large and small group sessions, workshops, videotape, visits to community programs, discussions, films, and reading. MATERIALS: The play, "The Me Nobody Knows." EVALUATION: Includes daily evaluations by participants during Summer Institute, periodic meetings with key consultant personnel, large group evaluation and critique session on final afternoon of Institute, evaluations by key consultant personnel after Summer Institute, and questionnaire completed by participants at end of Follow-up Program. MODIFICATIONS: Include earlier approval decision to facilitate recruiting, increase to 30 participants, assignment of major readings in advance, use of smaller panels, 2 days for ghetto visits, the addition of role-playing, and orientation meetings for participants. (MBM)

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FINAL REPORT

SUMMER INSTITUTE & FOLLOW-UP PROGRAM

IMPROVING THE SKILL OF COMMUNITY COLLEGE ENGINEERING TECHNOLOGY FACULTY IN WORKING WITH DISADVANTAGED YOUTH

SPONSORS: New York City Community College
&
Research Foundation of the City University of N.Y.

DATES OF OPERATION:

August 17, 1970 to August 28, 1970 SUMMER INSTITUTE
August 29, 1970 to January 31, 1971 FOLLOW-UP PROGRAM

FUNDING: Education Professions Development Act, Part F
Bureau of Inservice Education
State Education Department

PREPARED BY:

Dr. S.M. Brodsky - Project Director
Division Chairman
Division of Technology
New York City Community College

SP00 5417

MARCH 1971

CONTENTS

	Page
CAPSULE SUMMARY	1
ENROLLMENT	2
List of Participants	2
Publicity	4
Applicants	6
Group Characteristics	7
DESCRIPTION	10
Summer Institute	10
Follow-Up Program	17
EVALUATION	19
Objectives	19
Methods of Evaluation	24
Summary of Results	25
CONSULTANTS, STAFF, & VISITORS	35
PROGRAM IMPROVEMENTS	35
EXPENDITURES	37
APPENDIX A - Participant Questionnaire	38
APPENDIX B - Follow-Up Program Individual Demonstration Project Reports	41
APPENDIX C - List of Consultants & Staff	131

CAPSULE SUMMARY

Twenty 2-year college faculty members, who are involved with engineering technology students, were participants in a two-week Summer Institute and one semester Follow-Up Program to improve their understanding and skill in working with disadvantaged youth. Major emphasis was focused on Black and Puerto Rican students, their backgrounds, problems, viewpoints, and aspirations. A variety of experts, exercises, experiences, and materials were utilized both on and off campus during the intensive Summer Institute.

Participants developed individual demonstration projects which were carried out during the Fall 1970 semester and summarized in reports. A series of group meetings were held during the Fall semester at the request of the participants.

While a number of improvements have been proposed for any new program, evaluations by participants and key consultants were strongly positive.

ENROLLMENT

LIST OF PARTICIPANTS

Robert J. Albano, Electromechanical Technology, New York City Community College

Shirley Aronson, Physics, Nassau Community College

Jean Benninghoff, Physics, Nassau Community College

Frederick J. Berger, Electrical Technology, Bronx Community College

Robert A. Brienza, Electrical Technology, New York City Community College

Alan R. Brown, Automotive Engineering Technology, SUNY Agricultural & Technical College at Farmingdale

Edward Brumgnach, Electrical Technology, Queensborough Community College

Nathan Chao, Electrical Technology, Queensborough Community College

Anatole Dolgoff, Physics & General Science, New York City Community College

David T. Ferrier, Electrical Technology, SUNY Agricultural & Technical College at Farmingdale

Stuart B. Greenfield, Engineering Technology, Nassau Community College

Ronald W. Holloway, Developmental Mathematics, New York City Community College

Sidney Katoni, Mathematics, New York City Community College

Saul Levinson, Mechanical Technology, Staten Island Community College

George B. Marshall, Electromechanical Technology, New York City Community College

James J. McGrath, Accounting, New York City Community College

John L. Mueller, Mechanical Technology, New York City Community College

Charles Rubinstein, Electrical Technology, Staten Island Community College

Lawrence W. Seigel, Technology Senior Placement & Cooperative Education Work Experience Program, New York City Community College

Henry Zimmerman, Chemistry, New York City Community College

PUBLICITY

On April 17, 1970 a letter and a 3-page descriptive summary of the project were mailed to 21 individuals at 11 two-year institutions as shown in the following table.

	NUMBER OF COPIES OF DESCRIPTIVE SUMMARY					
INSTITUTION	PRESIDENT OR DIRECTOR	DEAN	DIVISION CHAIRMAN	DEPT CHAIRMAN	FACULTY	
Academy of Aeronautics		10				
Bronx Community College		10		10		
Nassau Community College		5				
Queensborough Community College		10		10		
RCA Institutes	5	10				
Rockland Community College		10				
Staten Island Community College		10		10		
Suffolk Community College			5		5	
SUNY A & T College at Farmingdale			10	10	10	
Voorhees Technical Institute	10					
Westchester Community College				10		
TOTALS	15	65	15	50	15	
GRAND TOTAL						160

In addition on April 17, 1970, descriptive summaries were circulated to 58 technology faculty at New York City Community College including 6 members of a faculty Advisory Committee for the project. Information copies were also sent to the President, 4 Deans, and 2 Counselors. An information copy was sent to Dr. Allan Freedman of CUNY Division of Teacher Education on April 24, 1970.

On May 27, a copy of the descriptive summary was sent to the Chairman, Mechanical Power Technology Department, SUNY A & T College at Farmingdale in response to a request.

Three copies were sent to the Chairman, Physics & General Science Department, NY City Community College (May 28), and 5 copies each to the Chairman, Developmental Skills Department and the Chairman, Mathematics Department, both of NY City Community College (June 4).

Thus, by June 4, a grand total of 240 copies of the descriptive summary were distributed.

The Project Director was a speaker at two major technical meetings and took the opportunity to announce the planned program. The meetings were the Mid-Atlantic Section of American Technical Education Association at Voorhees Technical Institute on May 8, and the SUNY Annual Two-Year College Conference at Farmingdale on June 18-19. In addition to formal announcements, the Project Director telephoned individuals, spoke to individuals at various technical meetings, and urged faculty to register for the Summer Institute or convince others to do so.

APPLICANTS

The following table gives the chronology of applications and withdrawals for this project.

Application Date	Acceptance or Withdrawal Date	Applicant		Change	Cumulative Total
		Institution	Discipline		
23 April	29 May	SICC	Elect Tech	+ 1	1
23 April	29 May	NYCCC	Chemistry	+ 1	2
27 April	29 May	SICC	Civil Tech	+ 1	3
27 April	29 May	NYCCC	Elect Tech	+ 1	4
4 May	29 May	QCC	Elect Tech	+ 1	5
13 May	29 May	Nassau CC	Engrg Tech	+ 1	6
14 May	29 May	NYCCC	Fire Science	+ 1	7
15 May	29 May	NYCCC	Construct Tech	+ 1	8
19 May	29 May	NYCCC	Electromech Tech	+ 1	9
20 May	29 May	QCC	Elect Tech	+ 1	10
20 May	29 May	NYCCC	Electromech Tech	+ 1	11
21 May	29 May	Bronx CC	Elect Tech	+ 1	12
1 June	3 June	NYCCC	Construct Tech	+ 1	13
(15 May)	1 June	NYCCC	Construct Tech	- 1	12
2 June	3 June	NYCCC	Developmen-tal Math	+ 1	13
4 June	10 June	Nassau CC	Physics	+ 1	14
8 June	10 June	SICC	Mech Tech	+ 1	15

(Continued)

Application Date	Acceptance or Withdrawal Date	Applicant		Change	Cumulative Total
		Institution	Discipline		
8 June	10 June	Nassau CC	Physics	+ 1	16
15 June	16 June	NYCCC	Mech Tech	+ 1	17
15 June	19 June	NYCCC	Placement & Coop Ed	+ 1	18
16 June	19 June	NYCCC	Math	+ 1	19
18 June	19 June	NYCCC	Physics & Gen Sci	+ 1	20
(14 May)	6 July	NYCCC	Fire Science	- 1	19
(1 June)	6 July	NYCCC	Construct Tech	- 1	18
19 June	6 July	Farmingdale	Auto Tech	+ 1	19
23 June	6 July	Farmingdale	Elect Tech	+ 1	20
(27 April)	10 Aug	SICC	Civil Tech	- 1	19
24 June	12 Aug	NYCCC	Accounting	+ 1	20

In addition, 5 other inquiries were received; three from secondary school teachers, and two from NYCCC faculty (one English teacher, one Electrical Tech teacher). High school teachers were referred to other programs.

GROUP CHARACTERISTICS

The 20 participants are further described by the following characteristics:

	Characteristics	Group Description	
1.	Sex	18 Male; 2 Female	
2.	Age	1 under 25 yrs; 3 from 25-29; 6 from 30-34; 2 from 35-39; 2 from 40-44; 2 from 45-49; 3 from 50-54; 1 over 60	
3.	Ethnic Background	1 Black; 1 Oriental; 18 Caucasian	
4.	Highest Degree	4 Bachelor's; 16 Master's	
5.	Total Years in Field of Education	8 from 1-4 yrs; 3 from 5-9; 7 from 10-14; 1 from 15-19; 1 more than 20	
6.	% of Student Body in Participant's School Who Come From Families at or Below the Poverty Level (As Estimaced by Participants)	3 from 1-9%; 2 from 10-19%; 4 from 20-29%; 11 from 50-59%	
7.	Ethnic Background of Student Body in Participant's School (As Estimated by Participants)	% Black	5 from 1-9%; 2 from 10-19%; 13 from 20-29%
		% Puerto Rican	3 at 0%; 4 from 1-9%; 12 from 10-19%; 1 from 20-29%
		% Oriental	3 at 0%; 17 from 1-9%
		% Caucasian	1 from 40-49%; 12 from 50-59%; 2 from 70-79%; 2 from 80-89%; 3 from 90-99%

(Continued)

Characteristics	Group Description
8. Number of Institutions & Participants per Institutions	1 with 1 participant 3 with 2 participants 1 with 3 participants 1 with 10 participants

DESCRIPTION

SUMMER INSTITUTE

The 10-day Summer Institute (August 17 to August 21, and August 24 to August 28) was an intensive series of sessions, filling each of the days with approximately 8 hours of work.

Monday, August 17, 1970

9:30 - 11:00 AM: Welcome and official opening of Summer Institute; Distribution of name tags, schedules, and Institute kit materials.

Participant introductions and backgrounds.

Staff & Discussion Leader introductions and backgrounds.

Completion of various state and federal forms by participants.

Review of schedule and formats; discussion of purposes and objectives.

Discussion group assignments; reading assignments.

11:00 AM - 12:30 PM: Small Group Sessions - Group exercise, "Who Shall Survive?"

12:30 - 1:30 PM: Lunch; Continuation of small group sessions with "Who Shall Survive?" exercise.

1:30 - 2:00 PM: Large Group Session - Review of results of small group exercise; presentation of experience with this exercise in other groups.

2:00 - 5:00 PM: Large Group Session - "Overall Concerns" Keynote Speaker.

"Understanding Students - Academic Backgrounds" - Major Address
- Commentary by Resource Person

Open discussion, question-answer period.

Tuesday, August 18, 1970

9:30 AM - 12:30 PM: Large Group Session - "Understanding Students, Non-Academic Backgrounds & Experiences." Introductory remarks.

"Understanding Black Students" - Two Major Addresses.

Open discussion, question-answer period.

"Understanding Puerto Rican Students" - Major Address.

Open discussion, question-answer period.

12:30 - 2:00 PM: Lunch; Informal Discussions with speakers and staff.

2:00 - 3:30 PM: Large Group Session - "Analysis of the Autobiography of Malcolm X" - Major Presentation.

Open discussion, question-answer period.

3:30 - 4:30 PM: Large Group Session - "Racial Perceptions" Video Tape presentation.

Open discussion period.

4:30 - 5:30 PM: Small Group Sessions - Discussion of previous sessions.

Wednesday, August 19, 1970

9:00 AM: "A Day In A Ghetto Community"
Group assemble at College.
Transportation to Bushwick Community Corp.

9:45 - 11:00 AM: Large Group Session - "Background & Orientation to the Bushwick Community"

- Introductions
- Three Major Presentations
- Question-Answer period.

11:00 AM - 12:30 PM: Visits to operating community programs in groups of 3 or 4 participants with community consultants and guides. Each group followed different itinerary.

12:30 - 1:00 PM: Large Group Session - "The Food Stamp Program and Other Assistance Programs"

- Major Presentation
- Question-Answer period.

1:00 - 2:00 PM: Lunch

2:00 - 4:00 PM: Small group visits, continued. The day's visits included a variety of centers (such as manpower development, day care, food distribution, employment, welfare, family assistance, etc.) as well as visits to people's homes, youth activities programs, meetings with parents, meetings with young people, etc.

4:00 - 5:00 PM: Large Group Session - Summary Discussion of day's activities; closing ceremonies.

5:00 PM: Transportation to College.

Thursday, August 20, 1970

9:00 AM - 12:30 PM: Large Group Session - Review of previous day's activities.

- Panel, "From High School to College." 5 panelists and 2 resource people. Major Presentations; open discussion, question-answer periods.

12:30 - 2:00 PM: Lunch; Informal discussions with speakers and staff.

2:00 - 4:00 PM: Small Group Sessions - Discussion of previous session and assigned readings.

4:00 - 5:00 PM: Large Group Session - "Use of Language," Video Tape presentation and discussion.

Friday, August 21, 1970

9:30 AM - 12:30 PM: Large Group Session

- Panel, "The Student's Viewpoint." 8 panelists. Major Presentations; open discussion, question-answer period.

12:30 - 2:00 PM: Lunch; Informal discussions with panelists and staff.

2:00 - 4:00 PM: Small Group Sessions - Discussion of previous session and focus on faculty attitudes.

4:00 - 5:00 PM: Large Group Session - "Teacher Attitudes," Video Tape presentation and discussion.

Monday, August 24, 1970

9:30 AM - 12:30 PM: Large Group Session - "Technology Graduates from Disadvantaged Backgrounds in Industry & Related Topics."

- Panel of 8 industrial representatives
- Open discussion, question-answer period.

12:30 - 2:00 PM: Lunch; Informal discussions with panelists and staff.

2:00 - 5:00 PM: Small Group Sessions - Technology alumni consultants participate in small group discussions on same topics as morning session.

Tuesday, August 25, 1970

2:00 - 5:00 PM: Large Group Session "The Social Context I" - Review and discussion of "Down These Mean Streets."

- Film "The World of Piri Thomas"
- Open discussion of film and related topics.

5:00 - 8:00 PM: Dinner and travel to theatre.

8:00 - 11:00 PM: Theatre - Stage play, "The Me Nobody Knows."

Wednesday, August 26, 1970

9:30 AM - 12:00 Noon: Small Group Sessions - "The Social Context II."

- Discussions of play and selected readings.

12:00 - 1:30 PM: Lunch; Informal discussions with staff, including consultants for afternoon sessions.

1:30 - 3:30 PM: Large Group Session - "Teaching Techniques."

- Three Speakers; Major presentations; General discussion.

3:30 - 4:30 PM: Small Group Sessions (Three Groups) - "Brainstorming"; Generation of ideas for improved instructional techniques and concepts.

4:30 - 5:00 PM: Large Group Session - Review of ideas developed in brainstorming sessions.

Thursday, August 27, 1970

9:30 - 11:30 AM: Large Group Session - "Workshop on Teaching Techniques & Projects."

- Individual presentations of project ideas by participants, with comments by consultants and other participants.

11:30 AM - 12:30 PM:	Workshop Session - Independent project development session with consultant guidance.
12:30 - 2:00 PM:	Lunch; Informal discussions with consultants and staff.
2:00 - 3:30 PM:	Workshop Session, continued.
3:30 - 5:00 PM:	Large Group Session - "Proposed Projects" - Individual presentations of project proposals by participants. - Consultants' comments and suggestions.

Friday, August 28, 1970

9:30 AM - 12:30 PM:	Workshop Session - Final Project Proposals; Project agreements - Summary Sesson on Teaching Techniques; Open discussion.
12:30 - 2:00 PM:	Lunch; Informal discussions with consultants & staff.
2:00 - 5:00 PM:	Large Group Session - "Evaluation & Critique of Institute." - Discussion of various aspects of Institute; Individual and group judgements. - Future Plans for Group Meetings. - Formal Closing of Institute.

FOLLOW-UP PROGRAM

The initial plan was to have those participants who were working on follow-up projects to proceed independently with occasional guidance from the Project Director and project reports submitted to the Project Director before the end of January 1971. However, the participants requested several formal meetings during the fall semester to discuss project progress and other matters related to the Institute.

Thus it was decided to convert the initial plan to one which consisted of three meetings with agendas developed by a committee of participants. The three meetings were held on November 3, 1970, December 12, 1970, and January 23, 1971. Summaries of these meetings follow.

Tuesday, November 3, 1970

9:30 AM - 1:00 PM: Explanation and status report on new Statewide plans for similar summer programs in 1971-72.

Individual project progress reports; question-answer periods; critiques.

Plans for next meeting.

Saturday, December 12, 1970

9:30 AM - 1:00 PM: Review of advanced mailings of progress reports and other materials distributed. Discussion; question-answer period.

Presentation of CUNY Open Enrollment procedures and differences from previous admissions procedures.

Individual experiences with Open Enrollment.

Initial discussion of "Against The Odds."

Saturday, January 23, 1971

9:30 AM - 3:00 PM: Submission of individual project reports.

Discussion of individual project results.

Discussion of positive and negative aspects of the Summer Institute and recommendations for future Institutes.

Plans for new Institute.

Recruitment for new Institutes.

Discussion of several topics from "Against The Odds."

EVALUATION

OBJECTIVES

Objective 1 - To provide the participants with a matrix of factual information based on research and expert opinion.

Evidence - All participants received the following materials:

Books: The Autobiography of Malcolm X, A. Haley and Malcolm X, Grove Press, 1966.

Black Rage, W.H. Grier and P.M. Cobbs, Bantam Books, Inc., 1969.

Trespass, F. Knebel, Doubleday & Company, Inc., 1969.

Down These Mean Streets, P. Thomas, Signet Books, 1968.

Against The Odds, W. Moore, Jr., Jossey-Bass Inc., 1970.

One Year Later, Urban America, Inc. and The Urban Coalition, 1969.

Papers, Pamphlets, Periodicals:

"A Response to Approaches to Social Dialects in the Field of Speech," Orlando Taylor.

"Careers for the Technician, '70," Career Publications.

"Drug Terms Commonly Used in the Community of Washington, D.C.," AMIDS.

"Counseling the Disadvantaged: Avenues to Effectiveness," Edmund Gordon in Capsule, Winter, 1969.

"The Effect of Classroom Structure on Achievement and Academic Performance," A.S. Alschuler, Educational Technology.

"Review and Synthesis of Research in Technical Education," D.S. Phillips and L.D. Briggs, E.R.I.C., October, 1969.

"Let's Make Time The Variable and Learning the Constant," G.H. Flammer, ASEE, June, 1970.

"Motivational Determinants of Performance in Training," Manpower Research Study Summary, U.S. Department of Labor, 1970.

"Somos Puertorriqueños y Estamos Despertando," Puerto Rican Students Union.

"Rice and Beans Test," adapted from Training Manual, Part I, Intake, Orientation, and Assessment Regional Manpower Services.

"Statistical Data on Black America," reprint from The Negro and the City, Fortune.

"The Action Maze," AMIDS.

"The Chitling Test," New Republic, Dec. 16, 1967.

"The Challenge of Open Admissions, Will Everyman Destroy the University?", T.S. Healey.

"The Employment of Minority Youth as Technicians," R.L. McKee, ASEE, June, 1970.

"Myths in Black History," R. Russell, AAJC Minority Awareness Conference, July, 1970.

"The Narcotics Language," compiled by M. Janet, AMIDS.

"What Guidance for Blacks?", The Personnel and Guidance Journal, May, 1970.

"Toward More Authentic Interpersonal Relations Between Blacks and Whites," B.M. Lee and W.H. Schmidt, Human Relations Training News, 1969.

"Teaching Disadvantaged Youth," Third Annual National Vocational-Technical Teacher Education Seminar, Ohio State University.

"Understanding the Puerto Rican, His Culture and Society, Selected Bibliography," J.D. Vasquez, 1963.

"We, The Black People of the United States," U.S. Government Printing Office, 1970.

"Making Education Relevant," M.J. Feldman, Ford Foundation.

Newspaper Articles:

"Black Declaration of Independence, N.Y. Times, July 3, 1970.

"Black-White Income Gap Found Widening Here," N.Y. Times, July 3, 1970.

"Blacks 'Within The System' Gloomy Despite Progress," N.Y. Times, July 6, 1970.

"College Presidents Caution Money Crisis Imperils Future," N.Y. Times, July 13, 1970.

"Report From A Spanish Harlem Fortress," by Richard Hammer, N.Y. Times Magazine, January 5, 1964.

"State of The Labor Market," Editorial, N.Y. Times, July 15, 1970.

"Million Americans Quit Poverty Rolls," N.Y. Times, July 15, 1970.

"Right On With The Young Lords," by Jose Iglesias, N.Y. Times Magazine, June 7, 1970.

Evidence - In addition to the above items, an extensive display of relevant books, periodicals, magazines, newspapers, reprints, reports, etc., was available during the Institute for examination and circulation.

Evidence - The participants were exposed to formal and informal presentations and discussions by more than 50 consultants.

Objective 2 - To provide a variety of experiences for the participants which relate to the context of the problem.

Evidence - Participants were engaged in the following variety of experiences.

Large group sessions with formal presentations or panels. (14)

Large group sessions with Video Tape presentations. (3)

Large group sessions with film or theatre presentations. (2)

Workshop sessions relating to projects. (3)

Large group discussion or question-answer sessions. (20)

Small group discussion sessions. (7)

Small group brainstorming session. (1)

Small group visitation sessions. (6)

Informal discussion sessions. (10)

Large group follow-up meetings. (3)

Individual project activity.

Outside reading assignments.

Objective 3 - To make use of the foregoing information and experiences as a springboard for exploring ways to improve the teaching-learning process in engineering technology courses and other forms of communication with technology students from disadvantaged backgrounds.

Evidence - The last two-and-one-half days of the Summer Institute concentrated on teaching techniques and project development related to disadvantaged students. Individual projects and follow-up meetings continued this emphasis. Refer to specific sessions in Description-Summer Institute and Description-Follow-Up Program sections of this report.

Objective 4 - To provide opportunities for participants to demonstrate specific techniques in real situations, in the semester immediately following the Summer Institute.

Evidence - The Follow-Up Program provided this opportunity for participants to do individual projects in their home institutions.

Objective 5 - To disseminate to the technical education community the concrete findings, newly created techniques, and recommendations that result from the Institute and Follow-Up Program.

Evidence - Results of individual projects have been discussed and shared by the group of participants. Participants, in turn, will be sharing selected results with colleagues at their home institutions. Several participants have indicated the possibility of developing articles for publication based on their projects, and in one case a book may eventually result.

Furthermore, the Project Director is on the program of the American Society for Engineering Education Annual Meeting at Annapolis on June 21, 1971 to give a paper based on the Summer Institute & Follow-Up Program. This paper will be offered to ERIC or other suitable means of dissemination.

METHODS OF EVALUATION

The evaluation process was carried on at several levels and times. A summary of this process follows.

1. Daily evaluations by participants during the Summer Institute provided immediate feedback on facilities, formats, workloads, speakers, materials, etc.

2. Periodic meetings with key consultant personnel during Institute to evaluate past sessions and plan subsequent sessions based on participant comments and personnel observations.

3. Large group evaluation and critique session on the final afternoon of the Summer Institute.

4. Evaluations by key consultant personnel after Summer Institute.

5. Evaluation questionnaire completed by participants at end of Follow-Up Program.

In addition to these forms of feedback evaluation, further measures are available in terms of the proportion of participants completing the Summer Institute, the proportion of participants

contracting to conduct individual follow-up projects, and the proportion of participants completing follow-up projects. Furthermore, the quality of the completed projects may be judged for potential value.

SUMMARY OF RESULTS

Participant evaluations during the Summer Institute dealt largely with operational matters of meeting formats and timing. However, useful judgements were made concerning individual consultants' effectiveness and assigned readings. As a result of these responses, a few consultants would not be retained for similar services in subsequent institute programs, while most consultants performed satisfactorily. Several consultants made tremendously significant contributions to the institute. Participant evaluations of materials clearly established that the workload of assigned readings during the institute was extremely excessive. Thus, any new program would include provision for advanced readings assigned at least one month prior to the institute. The quality and variety of materials was considered excellent.

The periodic meetings during the institute with key consulting personnel were essential to maintaining a flexible, responsive program. Thus, numerous minor changes and a few major changes were made as the program progressed. These changes involved mainly timing and format of sessions, emphasis on specific materials, selection of film and Video Tapes, and scheduling of major presentations and small group sessions.

The large group evaluation and critique sessions held toward the end of the two-week institute program were followed up with a formal questionnaire in January 1971. The results of this anonymous questionnaire (see Appendix A) indicated the following response patterns.

1. Evaluation of the two-week Summer Institute (N = 20).

   55% = Extremely Valuable

   45% = Worthwhile

   0 = Minor Value

   0 = Worthless

2. Personal value of participation in an individual follow-up project (N = 18).

   61% = Extremely Valuable

   39% = Worthwhile

   0 = Minor Value

   0 = Worthless

3. Attendance at post-institute meetings (N = 20).

   30% = Attended all 3 meetings

   35% = Attended 2 meetings

   25% = Attended 1 meeting

   10% = Attended no meetings

4. Value of post-institute meetings attended (N = 18).

   44% = Extremely Valuable

   39% = Worthwhile

   11% = Minor Value

0 = Worthless

6% = No Response

5. Effect of post-institute meetings on individual project (N = 16).

44% = Positive Effect

56% = Little or No Effect

0 = Negative Effect

6. Have you continued to communicate with participants from other colleges as a result of the Summer Institute & Follow-Up Program? (N = 20)

55% = Yes

40% = No

5% = No Response

7. Effect of Summer Institute & Follow-Up Program on your relations with students (N = 20).

80% = Positive Effect

15% = Little or No Effect

0 = Negative Effect

5% = No Response

A total of 79 comments were included in the questionnaires. Of these, 60 were positive comments, 10 were neutral or explanatory, and 9 were critical or proposed changes.

The nine critical comments were:

1. More emphasis on what must be done to motivate and understand the black student.

2. Too much material was being presented.

3. Individual oral reports (in post-inst meetings) were too lengthy - time would be better spent on "Against The Odds."

4. Individuals still at initial stages of their projects therefore not much was gained from discussion of projects.

5. More viewpoints on race question should have been sought. Assumptions regarding irrelevance of aptitude tests, IQ tests, reading scores are nonsense. Standard 1960's liberalism which in some respects is quite similar to what was called racism in the 1950's.

6. Have participants read Malcolm X before they come to the institute. Limit individual comments in time; a few are overly redundant time after time.

7. Should have been more diverse representation of minority groups at Institute. Jewish and Chinese people could have shared their views and problems with us. Would have liked to listen to the views of a Black parent from the ghetto on the kind of problems his child faces in a ghetto school and at home. I would have liked to hear the views of a white public school teacher who teaches in a ghetto school. I would have liked to hear the views of more moderate black leaders, such as Roy Wilkins or Bayard Rustin . . . rather than the vociferous militants who have only their own vested interest in mind.

8. The program should continue, perhaps with some modification of student and panel selection. A cross section of ideas should be presented from extreme conservative to militant points of view.

9. Too much on the disadvantaged - not enough on working with them.

A few typical comments of the 60 positive ones were:

1. Program should reach every 2-year college teacher.

2. It was well organized bringing together faculty with common concerns and resource persons to help explore the concerns. It did not end in August, but will continue permanently.

3. Well timed, ahead of the Open Admissions first term; undisputedly needed; priceless in terms of a firsthand meeting ground with disadvantaged minority student's frustrations, aspirations, and hopes.

4. From the reading of the books we received and from the discussion I did get to know the history, plight, and aspirations of the black people in a way I would never have known otherwise.

5. Became aware of reading and attitudes and conditions I would not have been exposed to.

6. Would like to see the post-institute meetings last forever.

7. It gave me a better understanding of the disadvantaged student.

8. The follow-up project is probably the thing that made it "extremely valuable."

9. The institute motivated me to do my first classroom research to improve student learning.

10. Contributed to much more conscious self-evaluation, which is good.

The following evaluative comments were offered by several key consultants.

1. It is essential to induce participants to come to the Institute. They will not come to be "sensitized" but they are interested in improving their teaching techniques.

2. There appears to be a major difference in the way the participants view Puerto Ricans and Blacks. Puerto Ricans are viewed similarly to other immigrant groups with a homeland and cultural ties, and not threatening. Blacks are viewed as a native American group that hasn't moved up, and are a threat to individuals. Puerto Ricans are considered more middle class.

3. The experience of being with like-minded colleagues from other community colleges was a beneficial experience. The desire for mutual support was one of the dominant reasons for wanting to meet on a regular basis during the fall semester. This desire for follow-up, mutual support, and sharing experiences during the fall semester was one of the most significant events of the entire program.

4. Must observe group cohesiveness and wean slowly to return to individual productivity.

5. Development of the Follow-Up Program appeared to accomplish several things for the participants.

a. gave incentive to crystallize earlier plans or dreams into reality

b. received group feedback and support to proceed

c. provided reason to meet again as a group.

6. Use of a small group game or problem in the first session as an ice-breaker was very successful.

7. The program intensity left the group entirely exhausted.

a. need to assign readings in advance of the Institute

b. suggest advance orientation session for participants

c. time of 2 weeks appears to be optimum

d. group of 20 participants appears to be optimum, although could increase to 30 using 3 discussion groups.

8. Small group discussion sessions are most effective during the first week of the program.

9. Selected speakers and panelists should join small group discussion groups for part of the time.

10. Panels of 8 are too large. Should limit to 4 or 5 panelists and allow for more panel interaction time.

11. Viewing Video Tapes tends to be a passive experience. Careful planning for their use is essential and timing in program is crucial.

12. The use of theatrical media (film & theatre) on social problems worked well as a change of pace. This, however, is risky depending upon what is available at the time of the Institute.

13. The "Day in a Ghetto Community" worked well. Could extend to two communities and increase contact with parents and teenagers.

14. The teaching techniques portion of the Institute needs reshaping. This was the weakest part of the program, although the Follow-Up Program produced a number of excellent new techniques.

15. People felt changed by the Institute experience. There seemed to be movement toward

a. more awareness of their students, particularly minority group students

b. greater realization that a teacher can make a difference in the lives of students

c. recognition that teaching an engineering technology course requires that the instructor know his students as well as his subject

d. greater personal flexibility (hostile reaction became a more accepting reaction with the same provocation within two days)

e. more personal openness ("I never realized that I was putting students down when I said that")

16. Our own expectations for the participants could have been higher. Suggest more interaction in another Institute with role-playing situations, some non-verbal exercises, and simulation games.

17. The recognition that poor interpersonal relations, low teacher expectations and stereotyping impedes learning, frustrates students and creates counter-productive tension indicated that the Institute did achieve its objective.

Several completion ratios may be used as additional evaluative factors.

1. 100% (20 of 20 participants) completed the two-week Summer Institute.

2. 95% (19 of 20 participants) signed agreements to do individual demonstration projects during the fall 1970 semester as part of the Follow-Up Program.

3. 95% (18 of 19 participants) completed individual projects and submitted final reports.

The quality and potential usefulness of individual demonstration projects provide an additional dimension for evaluation. Titles of the 18 individual projects are listed below with their authors. Project reports are found in Appendix B.

1. Automated Student Response System, Robert J. Albano

2. A Physics Tutoring Program for "Disadvantaged" Students, Shirley Aronson

3. Discussions on Educating Disadvantaged Youth, Jean Benninghoff

4. Basic Electrical Tech Course for Hi-Risk Students, Fred J. Berger

5. Integrated Mode, Robert A. Brienza

6. Effect of Student Self-Evaluation of Drawings on Achievement in Engineering Graphics, Alan R. Brown

7. Student Team Teaching to Electrical Tech Fundamentals, Edward Brumgnach

8. The Daily Quiz as an Educational Tool, Nathan Chao

9. Physical Aspects of the Urban Environment (Emphasis, New York City), Anatole Dolgoff

10. Tutorial Program in Basic Electricity/Electronics Mathematics, David T. Ferrier

11. Student-Faculty Dialogues in Technology, Stuart B. Greenfield

12. Correlation of Existing or New Program Material with Existing Curricula on a Recitation by Recitation Basis, Ronald W. Holloway

13. A Project to Increase Student Awareness of His Own Process, Saul Levinson

14. Minority Group Contributions to Technology - Development of Teaching Materials, George B. Marshall

15. Preparing Students to Develop and Teach a Lesson, James J. McGrath

16. Urban Youth Views Technology, John L. Mueller

17. A Cooperative Education Program for Technology Students, Lawrence M. Seigel

18. The Effectiveness of Single-Concept & Multi-Concept Films in a Self-Instructional Program in Teaching a Unit in Introductory Chemistry in Community College, Henry Zimmerman.

CONSULTANTS, STAFF, AND VISITORS

A list of Consultants and Staff associated with this project is given in Appendix C.

Several persons requested and were given the opportunity to visit certain sessions of the Summer Institute or Follow-Up Program.

PROGRAM IMPROVEMENTS

Several approaches to program improvement were suggested in the comments of consultants given earlier. Based on these comments and personal observations the following improvements are proposed for a future project.

1. Earlier approval decision to facilitate recruiting participants and consultants.

2. Increase to 30 participants.

3. Assign major readings in advance of Summer Institute.

4. Use smaller panels - maximum of 5 persons.

5. Use two days for ghetto community visits in two different ghettos.

6. Add role-playing as an activity.

7. Bring together the previous group of participants and the new group of participants after the 1971 Summer Institute as part of the Follow-Up Program to generate additional project ideas and other joint activities.

8. Hold preliminary meeting with participants prior to Summer Institute for orientation and registration.

9. Add an Administrative Assistant to Aid the Project Director.

10. Change restrictions to cover costs of lunch meetings and dinner meetings which are scheduled parts of the project.

EXPENDITURES

The approved grant totaled $33,698, of which $31,198 was for proposed direct costs and $2,500 was for indirect costs.

Actual expenditures for this project are not available at this writing since we are awaiting the final accounting statement from the Research Foundation. A precise report on expenditures will be forwarded at a later date. However, estimated expenses for the project were approximately $27,500 in direct costs and $2,500 in indirect costs, totaling about $30,000.

Report prepared by

S.M. Brodsky, Project Director
Division of Technology
New York City Community College

APPENDIX A

PARTICIPANT QUESTIONNAIRE

1970 SUMMER INSTITUTE & FOLLOW-UP PROGRAM

PARTICIPANT'S EVALUATION QUESTIONNAIRE

1. In retrospect, how do you evaluate the two-week Summer Institute (August 17-28)? (Check one)

__ Extremely Valuable __ Worthwhile __ Minor Value __ Worthless

COMMENT:_____

_____

_____

2. Of what personal value has your participation in an individual follow-up project been? (Check one)

__ Extremely Valuable __ Worthwhile __ Minor Value __ Worthless

COMMENT:_____

_____

_____

3. Which, if any, of the post-Institute meetings did you attend? (Check where appropriate)

Meeting	Attended	Not Attended
Nov. 3	__	__
Dec. 12	__	__
Jan. 23	__	__

IF YOU HAVE ATTENDED ONE OR MORE OF THE POST-INSTITUTE MEETINGS, PLEASE RESPOND TO QUESTIONS 4 through 7.

IF YOU HAVE NOT ATTENDED ANY OF THE POST-INSTITUTE MEETINGS, PLEASE SKIP TO QUESTION 6 AND RESPOND TO QUESTIONS 6 through 7.

4. Did you find the post-Institute meetings which you attended of value? (Check one)

__ Extremely Valuable __ Worthwhile __ Minor Value __ Worthless

COMMENT:_____

_____ 39 _____

PARTICIPANT'S EVALUATION QUESTIONNAIRE (Continued)

5. Did the post-Institute meetings which you attended have any effect on your individual project? (Check one)

__ Positive Effect __ Little or no Effect __ Negative Effect

COMMENT:_____

_____

_____

6. Have you continued to communicate with participants from other colleges as a result of the Summer Institute & Follow-Up Program? (Check one)

__ Yes __ No

COMMENT:_____

_____

_____

7. What effect, if any, has the Summer Institute & Follow-Up Program had on your relations with students? (Check one)

__ Positive Effect __ Little or no Effect __ Negative Effect

COMMENT:_____

_____

_____

(You are invited to add any additional comments which you wish to make in the space below)

_____

_____

_____

_____

APPENDIX B

FOLLOW-UP PROGRAM INDIVIDUAL DEMONSTRATION PROJECT REPORTS

FINAL PROJECT REPORT

Automated Student Response System

By Robert Albano

Objectives

a. To get immediate classroom feedback for the purpose of evaluating all the students comprehension; and to evaluate the effectiveness of specific teaching techniques.

b. To get all the students to actively participate in the classroom learning process.

Description

a. Hardware

A sketch of the system is shown in figure 1. The main components are the teacher's console and the student selector switches.

The student may respond to a multiple choice question with 5 choices A,B,C,D or ? (I don't know).

The student's response is indicated on the teacher's console as follows:

Summation of Responses-

The summation of responses to each choice ($\Sigma A, \Sigma B, \Sigma C, \Sigma D, \Sigma ?$) are shown in the general form of a bar graph. This is located in the left side of the teacher's console and is implemented with 5 edgewise panel meters.

Individual Response -

Each student has a group of lights to indicate his response to the five choices. These lights are laid out on the teacher's panel in the same configuration as the student desks are arranged in the classroom. Therefore the teacher can easily identify a group of lights with a student desk and therefore a particular student.

b. Software

The software consists of the operating instructions and the plans to use the system.

The plan was to use the student response monitor system in the normal lecture type of instruction. This immediate feedback was used by the teacher to evaluate if learning was taking place and if so by what percentage of the class.

A second reason for requesting the student response by the entire class was to coerce the students to become an active part in the classroom learning experience.

Results

The method of evaluation was to use the system on a test class, and standard lecture techniques on a control class. The results of this testing program is listed below:

a. Questioning Techniques

Several methods of presenting questions were evaluated. This included O/H transparencies, blackboard and oral questioning.

The method which was best for my style of teaching and for the course material that I was teaching (Digital Controls) was to present the question orally and to write the possible answers on the blackboard.

This worked well because the answers were very short.

If the presenting of questions or possible answers were lengthy or complex the O/H transparency technique would have been better.

b. Effect of Immediate Feedback on Lecture

This initial use of this system served very well as a pre-test for the class. I found that a large portion of the class didn't have a command of the prerequisite material. Therefore I didn't continue with the planned lecture but reviewed the prerequisite material.

While the semester progressed and the majority of the class was in phase, I used the immediate feedback to modify the pace of presentation, or change an approach of explanation.

The students were very receptive to the system. The outgoing student had his chance to respond without dominating the class. The introverted student had his chance to respond without the pressures of possible mistakes. The daydreamer was more alert because he had to respond.

c. System deficiency

The weak link in the system is the student selector switches. They are not student-proof. The students are rough with them and cause a misalignment of the switch setting and switch contacts (switch points to A but contacts B are closed).

I had modified the switch knob to prevent this problem. This had only limited success.

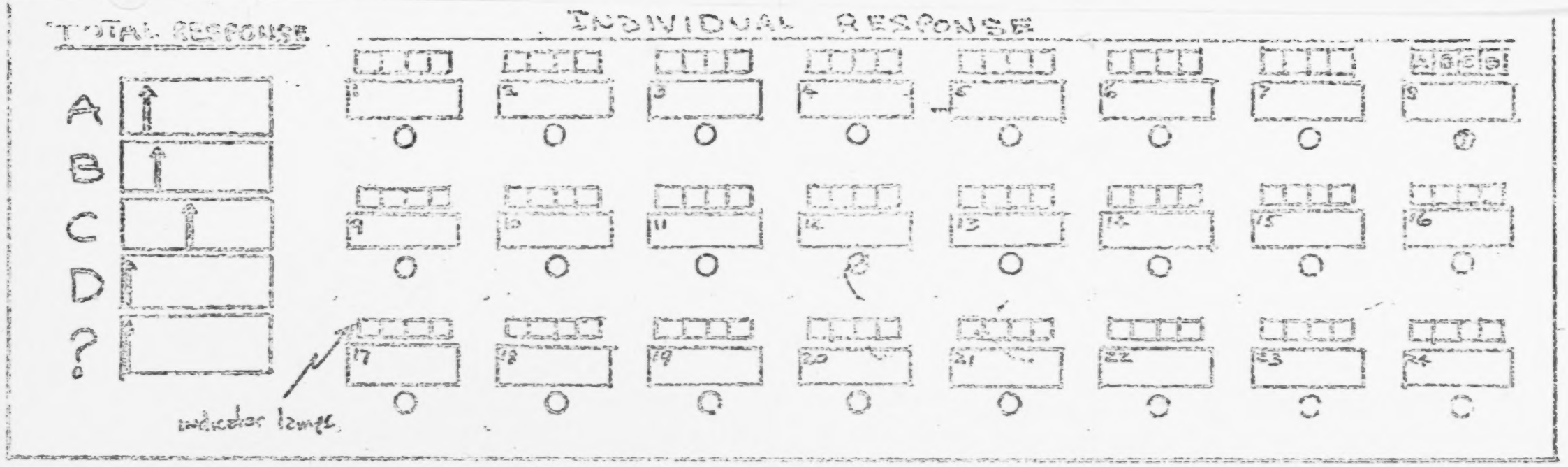
I intend to replace the selector switch with thumbwheel switches. This is much more rugged and cannot have misalignment problems.

Conclusions

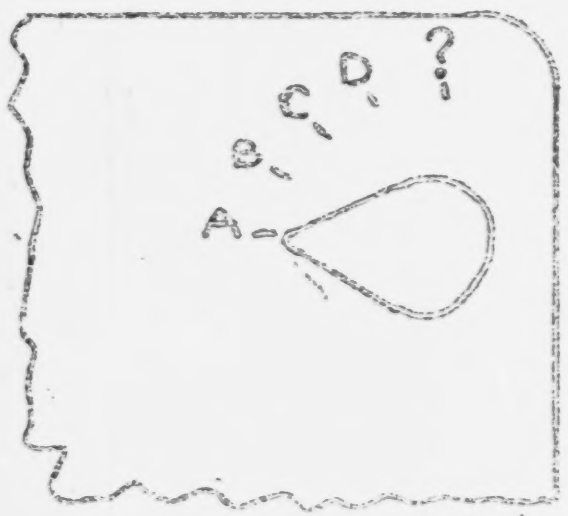
a. Learning difference

The test class achieved slightly higher than the control class. I am not sure if the difference was solely due to the use of response system. The testing procedure may have biased the results.

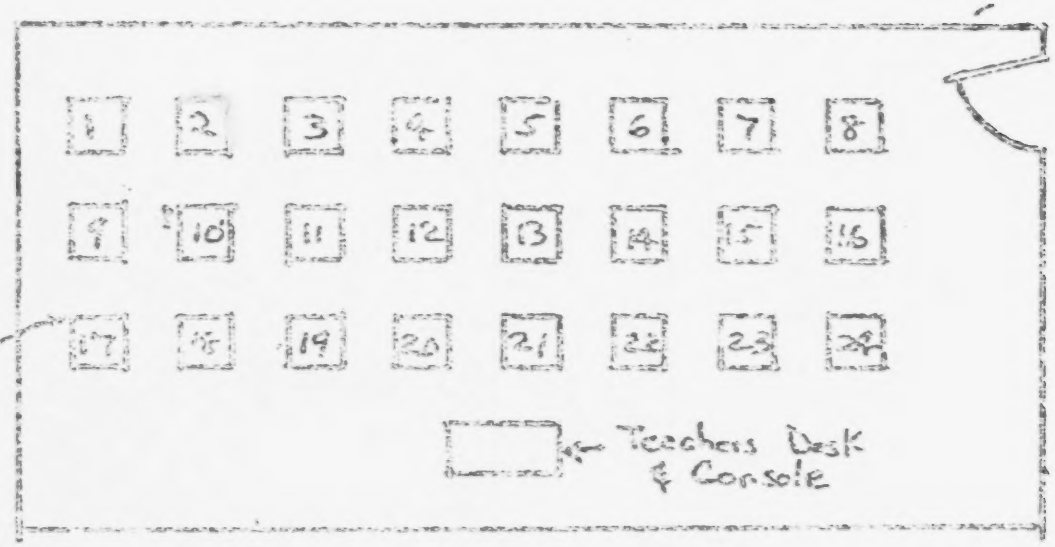
b. A major unexpected benefit from the use of this system was the development of behavioral objectives for the lesson. (What can the student do now that he couldn't do before the lesson).



Note: The indicator lamps are different colors



Detail of Student Response Unit on each desk



CLASS ROOM LAYOUT

Figure 1 - STUDENT RESPONSE MONITOR SYSTEM

REPORT OF PROJECT

A Physics Tutoring Program for "Disadvantaged" Students

By Shirley Aronson
Nassau C.C.

General Objective:

To provide a free tutoring class to all students taking the first year physics course. Since most of those students have trouble with the course are the technology students* this should be helping them primarily.

Specific Objectives:

1. To make available to students, in need help in homework, report writing and reviewing for exams.
2. To help personalize the physics instruction by providing contact with peers who have succeeded or at least are succeeding at physics in a setting less formal than classroom.

Description of Plan & Procedures & Summary of Findings

During the first week of classes in September efforts were made to get tutors. From faculty recommendations I selected a technology student who had finished Physics 101 and 102[2] and had done well and a physics major who was taking the first physics course Physics 122.[3] They were to be paid $2.50 per hour, but neither one of them seemed to care about the money.

I discovered that our department does not have a list of tutors and hope to help get such a list prepared.

All teachers of Physics were told of the tutoring session. It was to be held during a club hour (1 1/2 hrs. once a week) when there were no classes.

It was only after the first major exam in any of the classes that more than one or two students came to the sessions - some of them were told that they had to come.

It became clear by this time that we had an unusually complacent and irresponsible group of students who were not particularly conditioned to fear failing a course. This was pointed out to me by another teacher.

I circulated a printed reminder about the session in the third week to all of the students with little affect. We had by this time five or six regular students out of a total of about 145 By this time our physics major tutor felt that she needed at least a full semester of physics behind her to be a successful tutor and so dropped out until next semester. Because of such low student demand we did not really need her at that point.

From Thanksgiving on, the sessions drew less and less students - so that by the end of the semester no students were coming. Perhaps if failing the final exam would have hurt their grades a few students might have felt impelled to come - but we decided that students would not be penalized for such a failure.

As I reported earlier[4] limited tutoring session preceding <u>each</u> class - perhaps before each laboratory would probably be more successful.

Since the sessions were held in the laboratory preceding my own class - many (approximately 50%) of my students started to come about 1/2 hour earlier since they knew the room would be open and someone would be there to answer their questions. They didn't have to go out of their way - they were coming to that room at about that time anway. I hope to try this for all physics classes for the Spring semester.

In retrospect the initial objectives should have contained one such as "to arrive at a method or set of methods that would assure that most students in need of tutorial help come to the sessions. In need meaning in need as the teacher would decide."

Hopefully the mini-sessions should help in this area. This semester turned out to be the worst possible one in trying to coordinate this service with Project Opportunity and our academic counselors. [illegible] school year trying to get us [illegible] were not interested at this time in anyone else's activities. Also, our academic counselors were suffering an upheaval in their departmental organization and therefore had not time or inclination to participate in this program. I will follow up in trying to make these connections in the spring semester.

I started two other projects because of stimulation by the Institute and this project. One was to collect information weekly from my class about their reactions to the course (see Form A) and the other (as a result of Form A) to allow unlimited numbers of tries in passing tests and quizes. I hope to refine and analyse both of these projects by the end of the academic year. They seem superficially successful.

Preparing a faculty telephone list proved impractical, however students were encouraged to exchange telephone numbers with at least one other student in class.

Evaluation & Conclusions

Although the stated objectives were not achieved for any significant number of students, the failures have indicated new directions for following semesters.

I have a departmental committment to provide partial funds for tutors for the next few semesters and with the revised time organization more students should at least be present at the sessions.

A general impression that I have had, that has been reinforced by the above described experience is that such projects are stop gap solutions at best and until our physics instruction can be as individualized as possible our students, particularly the "disadvantaged" ones will not be properly reached and helped.

Footnotes

1. Of approximately 145 students originally enrolled in Physics 101, about 40 are technology students.

2. Physics 101, 102 is the required Physics course (non-calculus) that our technology students take.

3. Physics 122 is the first calculus Physics course that our Physics majors take.

4. Informal Progress Report submitted to Professor Brodsky in early December.

5. Form B was given to all students as a reminder after being orally informed of the sessions two weeks before.

6. Form C was prepared but not used because of the small number of students at session. Those at the session felt that their time spend was worthwhile.

FORM A

PHYSICS 101-102

QUICK FEEDBACK FORM

PLEASE SELECT THE LETTER CLOSEST TO YOUR ANSWER.

1. How many hours have you spent studying Physics this week?

A	B	C	D	E
8	6	4	2	0

2. This week the Physics classes, on the whole, were

A	B	C	D	E
Completely Unclear	Unclear	Clear	Pretty Clear	Completely Clear

3. Topics covered were

A	B	C	D	E
Much Too Much	Too Much	About Enough	Not Enough	Way Too Little

4. Homework problems on the average were

A	B	C	D	E
Very Difficult	Difficult	About Right Level	Easy	Too Easy

5. Test(s) given were

A	B	C	D	E
Very Easy	Easy	About Right Level	Hard	Very Hard

6. Lab Exercise was

A	B	C	D	E
Very Useful	Useful	Not particularly Useful	Useless	

7. Any Other Comments:

FINAL PROJECT REPORT

Discussions on Educating Disadvantaged Youth

By Jean Benninghoff

The aim of my project was to help faculty members of the Engineering/ Technology/ Physical Science Department at Nassau Community College gain a deeper insight into the problems of minority group students and economically disadvantaged students in general so that a larger percentage of them would be in favor of open enrollment at Nassau Community College and so that all could function more effectively as teachers of disadvantaged youth and as more sensitive citizens in their own communities and in the college community. Thirty out of thirty-five of our faculty members signed up for the program so I did not think it necessary to open up the program to a larger group. If the program was opened up to the college as a whole it might be attended exclusively by people who already knew a good deal about the subject rather than by those most in need of the educational experience. Also, too large a group would inhibit discussion. I also invited all members of the collegewide committee on open admissions to the program as well as counselors and members of the staff involved in special programs for black students.

I have enclosed the outline I distributed, listing the discussion times, speakers, and recommended readings.

The library cooperated by purchasing ten copies of "Against the Odds" and "The Autobiography of Malcolm X." We also had sufficient copies made of Kenneth Clark's article on "Intelligence, the University and Society" to distribute to the group. At the request of Candido de Leon, our first speaker, I ordered and distributed 20 copies of the Puerto Rican Student Union pamphlet and Palante, the Young Lord's newspaper before the first discussion. The other readings were available in single copies on a shelf in my office. The four months over which the program extended was adequate time for all the materials to be read.

Candido de Leon discussed with us the problems of educating the disadvantaged student in general and the Puerto Rican student in particular. He recommended that disadvantaged students not be permitted to hold jobs while attending school because they needed extra study time to catch up on basic skills. He emphasized the importance of a precise assessment of the capacities of these disadvantaged students and a thorough orientation before starting their program so that each student would understand the limitations of the course and the future it would lead to as well as acquaint him with other courses and their futures. Dr. de Leon's talk was received with interest by our group although not with complete acceptance. He said he felt it was just a matter of time before Nassau County public institutions of higher learning would be pressured into open admissions now that the city had it. He advised us to prepare now by having the necessary developmental programs and tutoring services in operation, because the "open door" would only become a "revolving door" if disadvantaged students were not prepared for college level courses before being put in with the group of higher achievers.

Our second speaker, James Wooten, who addressed the group on November 10th did not spare his punches. He drew the black militant's picture of the cultural background of the black student in our society and made some recommendations to help make our society and our educational processes more equitable. He felt that some of the technology courses in our curricula should be replaced by sociology courses because technology could be picked up by on-the-job training. The sociology courses, especially if given by black faculty members, have a higher priority because they might help the schools produce human beings with a greater depth and breadth of understanding of other human beings, instead of producing more technicians. The response of some of our group to this speaker was verbal violence. Black members of our college tried to moderate the discussion between Mr. Wooten and the faculty members who could not tolerate having the collective blame for the white man's unfair treatment of the black heaped on their shoulders.

Dr. Glanville, our speaker on December 8th, was a black psychiatrist who had counseled black students attending various colleges in the city. He was very learned in giving his view of the psychological framework of the disadvantaged student and then in his discussion of the book, "Black Rage." The discussion was heated but not violent. However, many members of the department lost interest in the program by this time and only attended the final session in January out of loyalty to me so that my speakers would have some audience.

In January the attenuation of interest was so apparent that we extended the morning program till 1:30 so that the listeners could have some opportunity to question the speakers, but not be forced to return after lunch for our projected final discussion of the whole program.

Noel Palmer and Mrs. Wright, our first two speakers on January 20th, discussed the "Education and Community Experiences of Nassau County Youth." Noel Palmer pointed out that the diversity in those experiences was as great within Nass County as within the whole megalopolis of which New York City is a part. Even within a small district on the south shore of Long Island called The Five Towns, the average family income varied from less than $8,000 a year in Inwood to over $25,000 a year in Hewlett Harbor. He pointed out that many youth in Inwood rejected the "system" before becoming seniors in high school and their consequent disruptive behavior forced them out of school before they could graduate. Education was failing for them because they felt their opportunities would be severely limited even with the high school diploma. He told how a weekend tutoring program which brough high school seniors on the Farmingdale campus for the whole range of campus activities as well as tutoring, stimulated these high school seniors to work much harder when they returned to high school. It also gave them the will to succeed when they entered Farmingdale college the next fall. They needed to have "apiece of the action" in our society to be stimulated to do their best. He also told the group about the activities of the Urban Center which was established at Farmingdale under his guidance last July. His talk was positive and well received.

Mrs. Wright told us about special programs which had been developed from high school right on down through nursery school and eventually even pre-nursery school to help children from economically deprived homes learn better when in school.

cont'd

In particular, a verbal interaction program in which trained social workers brought toys into the homes of poor families and trained the mother to talk to two year olds about these toys was found to raise the I.Q. of these children 17 points in less than a year. Another point she stressed was the necessity to prepare both employer and employee when placing disadvantaged youth in a job. A rejection from an employer does great damage to these youths whose level of self confidence is already low. This advice applies to the student-teacher relationship also.

Dr. Brodsky, our third January speaker's thorough job of reporting on Open Enrollment at CUNY in general and NYCCC in particular was of great interest to the faculty of a college contemplating Open Enrollment. But his remarks about the value of the policy were of greater importance. He painted a picture of a university bursting at the seams, with needs for remedial work which far exceeded the available facilities, and with constant work required to prevent disorder from erupting, and yet he said it would be better for CUNY to collapse from the strain than not to have attempted the plan at all. He felt that Nassau Community College should have a student body equally representative of the population cross section existing in Nassau County.

My "mini-institute" was patterned after the summer institute but spread out over a whole semester so that the meetings would fit into the normal teaching schedule and not be too much of a burden on people coming on a voluntary basis. However, the extended time period plus the negative reaction of some of the leadership of the department toward the black militants combined to reduce the interest of the group. The chairman of the department may not have enjoyed having the black members of the college witness the strong reactions of some members of the department to the black militants.

Such an educational experience needs time to ripen in the minds of the participants before any positive changes of attitude can occur. I am optimistic enough to believe that it was worthwhile in the long run even though the immediate results were disappointing. I had hoped there would be more willingness for open discussion among the group but instead there seemed to be embarrassment at the differences in our attitudes.

If I had to do it over again, I would include the math department in the original group of participants. Also, I would start off with a one day program featuring all the speakers we had with their contrasting manners and messages so that the negative feelings aroused by the militants would not be allowed to fester too long in their minds. Then I would allow the program to extend for two or three months with periodic lunch time discussions of the books supplied.

	DATE	LECTURE
I	Thurs. Oct. 8 11:30 - 12:45	"Educating The Disadvantaged Student" Speaker: Candido de Leon, Dean of Administration Hostos Community College Readings: 1. Against The Odds by Moore 2. "Intelligence, The University And Society" by Kenneth Clark 3. Puerto Rican Student Union 4. Down These Mean Streets by Piri Thomas
II	Tues. Nov. 10 11:30 - 12:45	"Cultural Framework Of The Student Disadvantaged" Mr. James Wooten, Director of Community Services, Staten Island Community College Readings: 1. Autobiography of Malcolm X 2. The Other America by M. Harrington
III	Tues. Dec. 8	"Psychological Framework Of The Disadvantaged Student" Dr. Cecil Clanville, Psychiatrist Readings: 1. Black Rage by Grier & Cobbs 2. "The Concept Of Identity In Race Relations" By Erickson In Daedolus The Negro American
IV	Wed. Jan. 20 10:00 - 12:00 1:00 - 3:00	1. "Education And Community Experience Of Nassau County Youth" Speakers Mr. Noel Palmer, Vice-President In Charge Of Urban Center, Farmingdale Com. Coll. 2. "Open Admissions At New York City Community College" Dr. Stanley M. Brodsky, Chairman, Div. of Tech. New York City Community College Readings: 1. "Employment, Income And The Ordeal Of The American Negro" by Moynihan In Daedolus 2. "The Social And Economic Status Of The Negro In The U.S." By St. Clair Drake

BRONX COMMUNITY COLLEGE
of THE CITY UNIVERSITY OF NEW YORK
120 EAST 184th STREET BRONX, N. Y. 10468 933-7000

DEPARTMENT OFFICE

DESCRIPTION OF PROJECT

TITLE:

Basic Electrical Tech Course For Hi-Risk Students

MAIN PURPOSES & OBJECTIVES:

1. To improve qualifications of students in entering an Electrical Tech curriculum.

2. To do this without loss of time toward graduation.

BRIEF DESCRIPTION OF PLAN & PROCEDURE:

Establish a new course to run parallel with the first conventional Electrical Tech course. Hi-risk students in small class size will have tutorial aids, programmed instruction; additional individualized instruction, increased time per week, slower pace, revised lab experiments, constant teacher attention to give them the opportunity to achieve a satisfactory level of learning comparable to the conventional course. Course credit will be earned by those students who complete the new course and pass an examination comparable to the conventional course.

I. SUMMARY OF RESULTS PHASE I OF THE PROJECT

1. It is possible to accelerate the course in "Introduction to Electric Circuits" (EC) by the utilization of the "Autotutor" (programmed instruction technique) for high-risk students lacking sufficient mathematical background for the conventional ELC 11 (Introduction to Electric Circuits) course.

2. Individual attention and personal guidance are needed to improve the academic level of the students.

3. It is possible to create the interest among the high-risk students to pursue their education in electrical technology without any considerable loss of time towards graduation.

II. ORGANIZATION OF THE PROJECT FOR PHASE I

1. ELC 01 (Basic Electricity) was offered. This course was presented during the day session of Fall 1970 to 14 students who lack the required prerequisites in mathematics for the conventional electrical circuit course. 7 hours per week was broken down in the following manner:
   A. Lecture demonstration 2 hours per week
   B. Program Machine Course (Autotutor) 2 hours per week
   C. Laboratory 3 hours per week (including individual student consultation)

2. The "Autotutor" is a semi-automated microfilm reader based on branched programmed method developed by Dr. Skinner for the Air Force and it is available commercially from "Seargent Welch Scientific Company".

3. Text used: Electric Circuits, Part I (Direct Current), by Richard Johnson, publisher Holt, Rinehart & Winston, Inc.
   Chapters covered 1, 2, 3, 4, 5, 6, 7, and 8.
   Topics covered: Structure of Material, Electrical Units, Ohms Law, Energy and Power, Sample Series Circuits, Parallel Circuits, Series and Parallel Circuits, Complex Laws, Kirchhoff's Laws, and DC Theorem and Introduction to AC Components.
   Laboratory Demonstration: Slide Rule Operation and Practice, Multimeter Operation and Practice, VTVM, Ohmmeter,

Principle and Practice, Resistance Color Code and Practice, and Application of Resistors.
Experiments Performed: Ohm's Law, Series Circuits and as a Voltage Divider, Parallel Circuits and as a Current Divider, Kirchhoff's Laws (Loop and Node Methods), Thevenin's Theorem and Superposition.

III. THE MACHINE COURSE (AUTOTUTOR)

1. The First Six Weeks

A. Students were scheduled for 2 hour machine sessions.

B. Records of the following were kept by the students and the instructors:

1. Starting point: Lesson--Frame--
At the end: Lesson--Frame--

2. Number of incorrect responses.

3. Instructor noted and recorded the difficulties and motivational progress of individual students.

C. Students were encouraged to participate in free discussions as part of the program material during the machine session.

D. Students were permitted to take notes if they felt that it was necessary, but this was not compulsary.

E. Students were permitted to go at their own pace with a minimum goal objective of one lesson per week. Additional machine hours were available during off periods to permit the slower students to cover the minimum weekly assignment or to permit the more ambitious students to advance.

F. Electrical components were constantly on display and available during machine sessions as a visual aid in order that the student may have an actual physical concept of the electrical elements.

G. The instructor was personally available for personal guidance when students had problems in understanding the contents of the program or instructions.

IV. OBSERVATION DURING THE FIRST SIX WEEKS

A. Students accepted machine sessions with great interest with 95% attendance experienced during machine sessions as compared to 75% attendance during lecture sessions.

B. Students (specifically slow readers) found the machine sessions more effective than the text for absorbing the course material.

C. Two hour machine sessions were found to be reasonable by most students.

D. The machine program became extremely effective when the material was covered in advance by lecture discussion.

E. One student had no interest in the machine, did not attend and dropped the course. Three students found the course extremely interesting to the extent that they utilized the machine in excess of 3 extra hours per week. 8 students exhibited normal performance and reaction.

V. SUMMARY OF THE RESULTS PHASE II OF THE PROJECT

1. In general, the performance of each student was considerably improved.

2. Students now unanimously experienced appreciation of the Autotutor as a good means of covering and absorbing all the material of the course, according to their maximum capability.

3. The Autotutor programmed instruction was found to be an excellent means of creating incentive among high-risk students for the electrical technology program. 14 students registered to take MATH 05 (Elementary Algebra and Geometry) simultaneously with ELC 01. 7 of the 14 successfully completed the course requirements. They were able to bypass ELC 11 (Introduction to DC Circuit) and continue with the next advanced course. 5 students were unsuccessful and they were told to register in the regular ELC 11 course. These 5 students now have a better chance to complete successfully the required ELC 11 course. 2 students dropped the course, 1 due to military service and the other for personal reasons.

4. The program did satisfy the basic purpose and objective of the project by advancing the high risk students who registered for the program without having the required prerequisites.

VI. ORGANIZATION OF THE PROJECT PHASE II

1. Supplemental text: Introduction to Electric Circuits, Johnson, was assigned.

2. Students were asked to read particular sections of the text before they worked on the machine.

3. During the programmed learning the students were asked to work out the problem before selecting their answers.

4. Tutoring classes were held to explain the material. Voluntary services were offered by senior class students to help with the mathematical problems, when the instructor was not available.

5. More emphasis was given to individual consultation with the students.

VII. OBSERVATION DURING THE SECOND HALF OF THE PROJECT.

1. The number of errors made by the individual student on the machine was found to be less. The performance of each student improved considerably.

2. Students seemed to have a greater feeling of confidence and security.

3. The number of students attending the machine session was found to be greater than that of the lecture class.

4. Now students developed a critical and analytical attitude towards electrical engineering problems.

VIII. CONCLUSION

1. The machine programmed learning created interest among the hi-risk students to learn text materials effectively - the student misses some points in lecture-demonstration, he can recover those points in the machine session.

2. Each student may progress at his own rate by taking advantage of the availability of additional machine time thereby reducing attrition.

3. Material should be covered in advance in lecture-demonstration before assignment of the machine material to students. This helps the student to analyze the problem and to learn the material effectively -

4. For better more effective teaching the following areas should be expanded -

   (a) More tutoring needed in mathematics such as decimal notation, scientific notations and simple algebraic equations.

   (b) Practical books with pictures of components, circuits and systems as supplementary materials should be made available.

   (c) More motivative recitation using visual aid in the laboratory work -

5. It was found that record keeping during the programmed learning sessions helped the instructor locate student difficulties and organize the lecture preparations more effectively with such non-homogeneous group -

6. In general the programmed instruction is a very effective teaching technique for bringing up the level of hi-risk students.

7. Students were well satisfied with their achievement during the term.

IX. PROPOASAL

1. Plan to apply our conclusions and the course of study developed on a larger scale. During the Spring semester of 1971 two sections of EICOI (Basic Electricity) will be instituted doubling enrollment to 28 students.

2. Plan to expand programmed instructions in the first course of electronics for hi-risk students provided we will continue to have success with the follow-up classes.

Madhao V. Karche

Mr. M. Karche
Instructor (Elc 01)

J. J. Berger

Prof. F.J. Berger
Coordinator and Chairman
Engineering Technologies

SUMMER INSTITUTE PROJECT

BY ROBERT A. BRIENZA

PROJECT TITLE: INTEGRATED MODE

DESCRIPTION:

The "Integrated Mode" is a quasi-individualized mode of instruction in that for the most part a student works independently and at his own rate.

GENERAL OBJECTIVES ARE:

1. to reduce present attrition rate;

2. to teach electrical technology to the disadvantaged.

OBJECTIVE DOCTRINES ARE:

1. to make learning the constant with respect to a lower limit set by prevailing course standard;

2. to make time the variable with respect to an upper limit defined by a time block;

3. to provide for more efficient use of instructor and instructional time:

4. to afford each student with the opportunity of becoming all that he is capable of;

5. to provide the machinery with which to increase the probability of success.

LESSON ELEMENTS AND OBJECTIVES:

1. The Review-Coordination

   a) Proposes to integrate prerequisite materials with current course materials requirements.

      a-1) The lesson is examined for math content, slide rule requirement, and all other prerequired relevant materials which are to be prepared for review and ready reference.

      a-2) Supplemental materials required to reenforce the new learning experience are to be prepared for distribution to students prior to the lesson requirement.

2. Breadboarding

   a) Proposes to integrate "home-based" laboratory activities with school laboratory activities.

      a-1) Students will be given projects relevant to subsequent topic to do at home.

      a-2) Students will be required to make observations and answer questions based on the project.

a-3) Observations and results required are to be computer checked by student before scheduled session convenes.

3. The-Lab

a) Proposes to integrate theory sessions with laboratory sessions.

a-1) Relevant lab activity will immediately follow theory session.

b) Proposes to integrate theory and media.

b-1) Actual circuit set up on a master demonstration board will be used for lesson development.

b-2) All appropriate media will be used in conjunction with thoery presentation.

b-3) A responder-card puncher will be used to generate greater teacher to student interaction and for evaluation of teacher effectiveness and student learning.

c) Proposes to integrate laboratory activity with the media.

c-1) The audio-tutorial system will be used to guide the lab activity.

c-2) Each step of the laboratory activity will be checked by computer for accuracy and correctness.

c-3) The computer will provide positive sequential guidance and direction.

c-4) Successful completion of the lab activity will effect computer summary print out together with the next assignment.

d) Proposes to integrate teacher presentation with media presentation.

d-1) All materials needed for the various media are to be prepared and made ready for instructor use.

d-2) Assistance in proper and effective use of the various media will be given to any instructor so requesting.

e) Proposes to integrate audio-visual- CAI- tutorial systems.

e-1) Tutorial materials for various media are to be prepared.

e-2) Library facilities will be used as the media resource center.

e-3) Slow learners and poor achievers are to be encouraged and directed to use media.

e-4) Machinery is to be provided for make-up sessions.

f) Proposes to integrate teacher-peer tutoring.

f-1) Teacher will select more gifted students and inspire them to act as peer tutor.

f-2) Student needing help may seek out instructor, CLT, or peer.

4. Homework Assignments

g) Proposes to integrate problem solving with breadboarding and computer assists.

g-1) Student will be required to solve relevant problems.

g-2) Student may use breadboard as means of simulating problem as an aid to checking solution.

g-3) Student will be required to computer check solution before scheduled class convenes.

General Mode Features are:

1. Supplemental reviews
2. Computer assists
3. Positive sequential guidance
4. Prepared media
5. Summary print-outs
6. Definite homework assignments
7. Make-up machinery
8. Computer assignment checking
9. Tutorial machinery
10. Instantaneous interactions

Note:

Materials for each of the lesson elements have been developed and prepared. A lesson in this mode is to be demonstrated to the faculty of N.Y.C. Community College on February 25. 1971.

The lesson topic conductors is based on a session in DC Fundamentals.

About 90% of the material is in its final stage ready for presentation. All materials should be ready by February 25, 1971.

Effect of Student Self Evaluation of Drawings
on Achievement in Engineering Graphics

Alan R. Brown

ɔjectives:

To determine if more learning would result from student correction of their own engineering graphics drawings than if the drawings were corrected by the instructor.

escription:

Students were assigned at random to four sections of the course, and the two sections taught by the investigator were used in the test. A pretest was designed to measure the students' prior knowledge and skill in basic drafting information and procedures. The mean scores were 14.48 and 16.55 based on a possible 100 points. The lower scoring section was selected for the test group and the other for the control, thus preventing an initial advantage to the test section.

The two sections had the same instruction throughout the course. The first two weeks consisted of an introduction to graphics, sketching, lettering, and the development of the concept of view relationships. The drawings of the latter part of the course, cams and gears, were also excluded from student self correction. The nine mid course orthographic projection and geometric construction drawings were blueprinted.

The drawings of the test section students were blueprinted and returned to the students with a 3/4 scale carbon master reproduction of the correct drawing. The original was retained by the instructor while the student corrected his blueprint to comply with the correct drawing. The corrected blueprint was then returned to the instructor who determined the grade for the assignment by checking the correctness of lines and line positions on the original, and noting the students' effort in the correction of his errors in views, lines, lettering, and dimensioning.

The premise for the study was that the student that made the corrections on his drawing would learn the correct presentation more rapidly and/or thoroughly than the student that visualized the corrections made by the instructor.

The corrected blueprint was due the following period. Late drawings and missing blueprints resulted in lowered grades. The drawings of the control group were corrected by the instructor and returned to the students.

esults & Conclusions:

The post test mean score was 49.2 for the test group and 48.85 for the control group. Student withdrawals and post-test absences appeared to influence both means about equally. The control group had a higher college withdrawal rate whereas the test group had a higher course failure due to failure to submit assigned drawings. The section had a higher absence from classes but a lower official withdrawal.

There was a positive correlation between the test score and the grades the students received on their drawings. There would appear to be no difference in learning resulting from the two methods of drawing evaluation, as the comparison was conducted.

The method warrants further study, with possible modifications of procedure. Suggested modifications are:

1) The preparation of a list of all assignments and due dates and its distribution to the students.
2) Adoption of a policy of accepting no drawings after the beginning of the class following the one in which they are due, except for extenuating circumstances.
3) The distribution of the 3/4 scale ditto drawing and the blueprints at the class following the due date.

4) The stating of the corrected blueprint due date at the class following their distribution.

5) The establishment, with student acquaintance, of a definite grading system which would encourage submission of drawings and corrected blueprints on due dates.

6) The reduction from 18 to 15 assigned drawings, allowing more time for student corrections.

7) The making available of, and requiring all drawings to be done on, a specific tracing paper.

8) The requirement that all students have basic graphics equipment for the first class, with the provision to loan equipment to those that do not have it.

These changes could reasonably be expected to facilitate the learning of engineering graphics by the disadvantaged student because they would provide him an opportunity to work ahead on drawings he understood and thus allow him the extra time for others. It would also give him a firm date to have each drawing or correction completed, a help in establishing good working habits. The reduction in the number of assignments would allow the student more time to do his drawing and to make meaningful corrections on his blueprint. The same basic instruction and requirements would also be applied to the control section.

Further investigation, involving these modifications of procedure, may result in a statistically significant higher score for the disadvantaged student who learns through doing his drawing and then correcting the blueprint.

Final report on:

"STUDENT TEAM TEACHING TO ELECTRICAL TECH FUNDAMENTALS"

Submitted to: Dr. S.M. Brodsky
Project Director
1970 EPDA Summer Institute

By: Edward Brumgnach
Participant

At the beginning of the term, I introduced the ideas of my project to my AC class in an informal discussion. The project was received with a great deal of enthusiasm. Students organized themselves into groups and each group picked a particular area in which they would become "experts". It was agreed that I would present any new material (complex algebra in particular) but once the presentation had taken place I would become more of a resource person or reference source rather than the main "lecturer", leaving the "expert" student groups to lead the discussion of particular examples.

This part of the project worked out very well throughout the term with the major drawback being that the presentation periods were longer than I expected in the beginning.

At the start the groups leading the class in the solution of examples were very inefficient and the whole thing seemed a waste of time. With some further experience, however, most of the individuals in the group took the initiative and examples were solved with only moderate amount of help from me.

This apparent success was probably due to the fact that the material the groups were asked to "handle" was not new but a carry over from the previous term. Furthermore we had available a Hewlett-Packard calculator that had a polar to rectangular and rectangular to polar function. This freed all the solutions from the pedantry of manual or slide rule complex algebra conversions. The result was that attention could then be focused on the circuit analysis aspects of the problems which were a carry over from the previous term. The other main advantage of the calculator was that it saved a lot of calculation time thus allowing more examples to be presented.

A similar procedure was entirely non successful in the DC class. This seems to indicate that students need a little time to become comfortable with new knowledge.

This student team teaching method seemed to have fulfilled my main objectives of developing the student's self-confidence by increasing his involvement and cooperation in an increased atmosphere of "learning" (while reducing the "teaching" atmosphere).

Part of the success of this method has to be attributed to the room itself. I held class in a room with regular chairs around a table (rather than regular class room seats) which seems to have lessened the formality of the class meetings.

The set-up was very congenial for the presentations and it prompted individual reaction during discussions.

It was also part of my plan to have students grade each other's homeworks and get in contact with each other outside class-time. For this purpose I proposed to establish a telephone communication network among the members of the class. This way a student that got stuck in the solution of a homework problem could get immediate help by calling up one of his fellow students.

This part of my project "fell flat on its face". The original reaction to the proposed communication network was somewhat skeptical. Any further attempt to organize such a set-up was met with growing resentment by the students. It seemed that while they were willing to change the classroom procedures, they were not so enthusiastic about availing themselves by phone to other members of the class. Reasons for this skepticism however, are not very hard to understand. As a remedy I tried to introduce a substitute. I ordered through the departmental office, six cassette recorders which were to be used as follows:

1. I would correct homeworks and exams on the paper while making appropriate comments on the cassette.
2. The student would then be able to not only see the corrections but listen to a verbal explanation of his errors and some possible corrections.

It was my feeling that this would be a suitable substitute for the "telephone tutoring" proposed originally. I was unable, however, to implement this part of the project until the last two weeks of the term because the recorders did not arrive until then.

This extensive delay caused a change in the proposed use of the recorders. In the short time left, I recorded the solution of some examples and provided in detail solutions on paper. The package was given to the students as a take home assignment. According to the evaluations which were received back, such a use of the recorders seems to be very helpful to the students in understanding new concepts and clearing up misunderstandings. It seems that this take home "audio-visual" package was well liked by students because it allows them to review the material at their leisure and it offers a change of pace from the usual text-book reading.

This term I tried to establish and evaluate some sort of a self-tutorial method of instruction. I was not completely successful in neither the establishment nor in the evaluation. I have however, investigated a few procedures which could become part of the proposed self-tutorial method. More important however, is that I have realized the ingredients that all these procedures should have in order to be successful with the students. These ingredients are:

1. The procedure has to offer a new approach to the old subject.
2. Some sort of physical gadget should be employed to command interest.
3. The approach has to be "individual" and not "collective".

4. The student should be actively involved as a critic or as an evaluator of the method.
5. The method should not even suggest that it might impose on the student's privacy.
6. The procedures should be pliable enough that they could be used at the student's leisure.

I intend to continue this project into the next term hoping to come closer in establishing a good self-tutorial method of instruction.

Final Report on:

The Daily Quiz as an Educational Tool

Submitted to: Dr. S.M. Brodsky
Project Director
1970 EPDA Summer
Institute

By: Nathan Chao
Participant

The two main classroom objectives of any teacher in a technical course are making sure the classhour really count as one hour of learning by all the students and keeping all the students at a level where they can assimilate all the material of the classhour.

The above objectives can become difficult to achieve especially if the majority of the students in the class have poor study habits and poor classroom concentration. This case is typical of many students in a community college and has become heightened in New York City by the new open admissions policy where all high school graduates can enter the college.

I originally proposed for a large class of about thirty students, the two main objectives mentioned above and some others could be attained without special equipment by dividing the normal classhour into three parts. During the first part, a team of students would be responsible for getting across to the class their preassigned lecture material by either straight lecturing to the class, or by a question-answer type of format or by any reasonable method they may think up.

It was my hope that this part of the classhour would:

1. Encourage student participation
2. Build student confidence
3. Develop student communication skill
4. Encourage student mutual assistance
5. Form more casual relationship between student and teacher through less clearly defined roles
6. Develop a sense of responsibility
7. Introduce a vocation (teaching) to the student

For the second part of the classhour the course instructor would present an illustrative example or problem dealing with the material presented by the assigned student team of the first part. The objectives of this second part are to:

1. Reinforce material presented by students during first part
2. Cover gaps and remove errors of the student team tactfully
3. Answer questions of students pertaining to the third part

For the third part a sample problem based on the first two parts will be given to the students to do and handed in. The type of problem or the same problem without numbers will be made known to the students a lecture in advance.

I originally thought that this part would:

1. Give student incentive to read in advance for the current lecture
2. Reinforce student attention for the first two parts

An additional proposal was to hand out daily lecture notes to the students. The reasons for handing out prepared notes are to:

1. Increase student attention and participation
2. Reduce strain
3. Insure accuracy

It should be noted that although not mentioned in the original agreement, I intended that the job of note preparation would be the responsibility of the assigned student team. They were to give me the notes a day or more in advance of their own lecture for me to reproduce.

I spent the first two lectures of the semester in the conventional lecture manner to give time for my project and the first student lecture team to get started. The next four classhours were carried out exactly as originally proposed. I eliminated the use of student lectures after the fourth session. However I experimented further with daily student testing.

The reasons why the first part or student lectures were entirely eliminated are:

1. General student opposition to the additional burden
2. Uneven lecture quality
3. Poor use of instructional time
4. Unexpected student hardship in the preparation of the lectures.

I found myself spending up to an hour assisting and answering the questions of each student team. I anticipated that as the semester proceeded I would need every spare hour for the more valuable task of assting the slower or lazier students in the class. The other problem of student prepared lectures lies in the nature of a technical course where the student cannot hope to understand chapter 3 unless he mastered chapter 2 making it very difficult for the student to prepare a lecture of quality even a few days in advance in his own tight schedule.

The elimination of the first part gave me more flexibility to experiment with the third part or the use of the daily quiz. I also took over the job of preparing hand-out notes in the form of periodic theory and formula summaries and step by step solutions of many problems instead of handing out daily lecture notes.

I further experimented with the administration of quizzes every session or every other session in some of the following ways:

1. Quiz given at the beginning of the period based on a previous lecture
2. Quiz given at the end of a period based on the current lecture
3. Quiz given at any time during the period when everyone in the class has no more questions to ask concerning a preassigned homework problem.

Although overall grades did not change substantially in all the quiz procedures, I did arrive at what I consider the best way to administer quizzes. As a result of verbal feedback from the students for more assimilation time and from my desire to give problems on quizzes with a little more depth, (more similar to major examination problems) I gave quizzes at every other lecture. My final optimum classroom format which I adhered to for the last three weeks of this past semester consisted of a two session block.

Session 1.

1. Return and go over graded quiz of previous lecture
2. Present new material to the class
3. Give an illustrative example if time permits

Session 2.

1. Give illustrative examples
2. Ask and answer questions
3. Give quiz

Often a teacher discovers a poor student after a midterm exam where the student may be so far behind that it becomes very difficult or even impossible for the teacher to help the student. The results of the quizzes enabled me to find out much earlier the students who may need assistance.

Throughout the semester I used the quiz grades as a constant monitor on class and individual progress. I selected poorer students weekly to see me with their graded quiz to immediately clarify any misunderstandings they may have. Sometimes I either gave the student another similar quiz in the office or a special homework assignment on the same material as a means of removing a bad grade and as an incentive to come for our meeting. In this manner I was able to keep all my students on a certain minimum level and had no student withdrawals for academic reasons and no failures.

The objectives attained by the use of quizzes at every session or every other class session include the following:

1. Encouraged students to keep up to date
2. Engaged constant student attention
3. Provided the instructor with an overall gauge of student assimilation of any particular topic
4. Gave each student an immediate indication of his own weakness or strength
5. Provided the instructor with an excellent guide for student counseling

From my experiences this past semester, I conclude that the proper use of quizzes at every session or every other session can definitely serve as a valuable classroom aid to good teaching. As for student prepared lectures, I still think it can be successful, but in a small class where the instructor has more time with each student and where each student has more opportunity to lecture. Having to lecture frequently, the student my develop a routine making the job of lecture preparation progressively less painful. The student can also improve the quality of his lectures sooner from the less imposing atmosphere of a smaller class and from more opportunity to practice.

If I ever get a class with fifteen students or less I may attempt to carry out all three parts of my original proposal again.

PHYSICAL ASPECTS OF THE URBAN ENVIRONMENT
(EMPHASIS, NEW YORK CITY)

Anatole Dolgoff

OBJECTIVES:

The combined effects of unbridled industralization and technological growth, together with geometrically increasing numbers, have vastly accelerated the concentration of the human population into small areas of the earth's crust. The resulting stress placed upon the resources of the earth - physical and biological - is enormous. Nowhere are the consequences of this stress felt more acutely than in the ghetto, the central city slums. Nowhere is an understanding of the physical processes involved more urgently needed and yet more lacking.

The purpose of this project is to develop a physical science course that will help eliminate this defficiency. The course must be broad enough to deal with the complex and tangled factors effecting the urban environment. Since we are dealing with the interaction between living things and the physical systems of the earth, the approach is through ecology and the earth sciences.

The course is envisioned as a one-year sequence.

COURSE OUTLINE

I. Introduction:

a. History of urbanization: growth of cities, patterns: industrial revolution, impact on demography; transportation nodes, impact on demography.

b. Population growth makes demands on resources of earth: food, water, raw materials, waste disposal.

c. Purpose of course: provide understanding of scientific basis of these problems.

d. Combines geology, meteorology, oceanography along with ecology to provide intellectual framework of analysis.

II. Basic physical principles:

Basic principles of physics and chemistry, written in simple non-mathematical terms to aquaint students with terms and concepts referred to throughout course. Principles always illuminated in terms of environmental problems.

II. The Asawan Dam:

a. An illustration to show interaction of human needs, politics with earth processes.

b. Reasons for construction of dam: population growth need for electrical power.

c. Expectations: benefits to be derived, balanced against various ecological catastrophes that will probably result.

IV. Basic geological concepts:

Concepts of balance between forces of uplift (tectonism) and erosion - other geological principles outlined as well.

V. Solar Radiation:

Source of solar energy: the energy budget of the earth's surface; the earth as a heat engine; the Greenhouse effect; conversion of solar energy into other forms; the distribution of solar heat.

VI. Meteorology:

The Greenhouse effect again; general atmospheric wind patterns; seasonal changes; small scale circulation patterns; diurnal effects; mountain-valley winds, etc.., orographic weather patterns; air stability, inversions.

II. The water cycle:

a. Properties of water related to unusual chemical factors: dipolar structure, hydrogen bond, Van der Waals bonds: the solid, gaseous, and liquid states: solvent properties, properties of sea water.

b. The hydrolygic cycle:
Aspects: runoff, ground water atmospheric turnover rates; circulation of ocean water; turbulence and mixing processes; of special interest - lake circulation, estuarine circulation: water and photosynthesis.

II. Important ecological factors:

a. Autotrophic and heterotrophic forms of life.

b. Photosynthesis and respiration: concept of an ecosystem - food chains; grazing and decay.

c. Energy relationships in food chain: tied in with solar energy, etc.

d. Concept of a stable community related to gross and net production; forms and varities of herbivores, predators. Two examples: grass land prairie community, oceanic food chains.

e. Evolutions significance - ecological and geological succession. The relation of biosphere to important element cycles:
(a) carbon - oxygen
(b) nitrogen cycles

IX. Human factors which disrupt ecosystems - too numerous to mention here emphasis not on listing of hazards, but specifically on how major cycles are disrupted; energy relations distorted.

X. Population growth and urbanization:

Demography, especially as it applies to urban areas; emphasis on United States, Western Europe.

XI. Feeding urban populations:

a. Ecological problems of agriculture; pesticides, herbicides, nitrate, phosophate enrichment leading to water and biological effects: erosion problems.

b. Distribution problems; food additivies .

c. Hunger: some causes and less obvious consequences: unequal distribution of food.

XII. Material resources:

Effect on environment of material mining, industrial production, waste disposal. Recycling problems: role of United States and cities as material consumer: role of United States and cities as material consumer compared to rest of world.

XIII. Energy consumption:

a. Changes in consumption due to new demands of technology during last 150 years: wood - coal - oil - nuclear fuels.

b. Problems: depletion of reserves: depletion of countryside ex. strip-mining.

XIV. Air pollution:

a. Emphasis on burning of fossil fuels, especially internal combustion engine.

b. Mechanical, meteorological, phtochemical problems.

c. Effects of air pollution on health and on economy.

d. Long range climate changes that might result.

XV. Water supplies and pollution:

Sources: systems of treatment, effects: problems in trying to correct present present practices; relation of sewage disposal to nautral circulation; waste disposal systems in a big city.

XVI. Solid waste disposal: problems of room, changing nature of garbage. Possible courses of action.

SUMMARY:

Recycling concept used both as means of providing tentative solutions and summarizing course; realistic goals. Scientific problems are developing out of causes which ultimately are those of human values, ethics.

RESULTS AND CONCLUSIONS:

It is too early to speak of results or conclusions regarding this course. First it must be instituted and refined over a few semesters by the experiences of my students and myself. Hopefully through this course, they will see the earth, their own urban environment, and the relevance of science in new prespectives.

January 22, 1971

Project Title: Tutorial Program in Basic Electricity/Electronics Mathematics
Conducted by David T. Ferrier at SUNY A&TC, Farmingdale, New York

Objectives: To help the academically disadvantaged youth in his successful completion of a course in Electricity/Electronics.
To help the "High Risk" student to acquire reasonable mathematical skill in connection with his needs in a Basic Electrical/Electronics Course.

Description: Weekly one hour math review sessions were conducted during 10 weeks of the Fall 1970 Term, in which individaul attention was given to students in their understanding of fractions, decimals, scientific notation, percentage, ratio and proportion, and use of the slide rule . At the end of the "pre-tutorial program math review" (about two weeks at the beginning of the term) a qualifying test was given and passed by twentyfour of thirtynine students who took the test. After completion of the tutorial program, near the term end, another qualifying test, which was considerably more comprehensive, was given, as a result 34 students (out of 39) qualified for a 20 grade point allowance on their term grade.

Results and Conclusions: Greatly increased interest and ability in performing mathematical operations was reflected throughout the entire term by the entire class. Class tension prior to the course final examination was reduced since the 20 point math qualification allowance made it possible for the student to relax, knowing that they already had "something" toward theirfinal grade.

As a result the grades on the final were better than the final examination grades were last year and the understanding of the class as a whole, for the course content was improved by reason of the math stumbling block which last year stood more completely in the way of the students understanding of the purely technical parts of the course.

The tutorial program materially helped a number of academically disadvantaged youths and they had this advantage as a result of my becoming aware of their need through criteria which I learned in the EPDA Summer Institute for Two-Year College Faculty on Improving Skills in Working with Disadvantaged Youth.

STUDENT-FACULTY GROUP DIALOGUES (IN TECHNOLOGY)

by Stuart B. Greenfield

OBJECTIVES

To ascertain whether a group dialogue technique could foster a better teaching-learning environment for both students and faculty, a student-faculty dialogue group began meeting on a regular basis during the Fall semester of 1970 at Nassau Community College. It was hoped that the dialogues would bring the students and faculty closer together, outside the classroom, and that improvements and adjustments in teaching and learning techniques of the faculty and students could be achieved while the courses were still in progress. This technique may be of especially pressing interest as more youths from disadvantaged backgrounds are enrolled into Technology programs at Nassau Community College.

DESCRIPTION

The sessions brought faculty members teaching technology courses in the three areas of Industrial Engineering Technology, Civil Engineering Technology, and Electronic Instrumentation Technology together with student representatives from each class section. Two Physics instructors, whose sections had been set up specifically for technology students were also participants along with their class representatives. The sum total of faculty invited to each dialogue was 11, with the number of student representatives being 15.

The format was an informal, open one where any and all discussions pertaining to the operation of the technology curricula and individual course sections could take place. Furthermore, any school related topic could likewise be discussed.

There was five meetings of the group during the semester. Each session had been set up to run for one hour fifteen minutes during one of the club hours on the school schedule, so that not only could the faculty and student representatives attend, but any student from the technology sections involved. The attendance at these sessions tended to be poorer than hoped but it stabilized by the third session to four faculty members and four students.

A lack of enthusiasm on the part of some faculty members resulted in the student participation being far below that expected. This was in part due to some faculty members not pushing the dialogue idea, not helping the students select representatives, and not notifying the students of meeting dates.

Although it would not be desirable to look too deeply into the actual content of the discussions, a brief idea of the types of problems discussed might be helpful in understanding the observations made later in this report. The major topics of discussion included:

1) the content of the labs and lectures in Physics and how it should relate to the technology programs
2) student developed lab experiments with guidelines vs. "cookbook" lab experiments
3) a particular instructor's classroom presentation, lab evaluation and grading
4) goals of one of the technology curricula and opportunities after graduation
5) ways to improve students' study habits.

2) Faculty Viewpoint - Observations & Recommendations

a) the dialogue provided a safety valve for student frustrations

b) it gave students an opportunity to see that the faculty were concerned

c) the faculty had opportunity to get student opinions

d) the dialogue stimulated creation of better ways of handling laboratory and classroom teaching

e) the faculty became more aware of other faculty members' problems

f) each technology program should hold dialogues

g) the math and physics teachers involved with students in a particular program should be included

As a result of this pilot project, and the enthusiasm of the student representatives and faculty members who attended regularly, the group dialogues will be continued during the Spring semester of 1971, in Electronic Instrumentation Technology and will include the Physics and Math instructors teaching sections with mostly Instrumentation students.

The dialogue certainly provides one technique to help humanize the student-teacher relationship - a process which has been long overdue in many curricula.

RESULTS AND CONCLUSIONS

Of course it would be impossible to come up with conclusive proof of the value or lack of value of this group dialogue technique based on five sessions. But an attempt will be made to communicate both the student representatives' viewpoint and the sympathetic faculty members' viewpoint. Included in the two viewpoints will be recommendations which were made at an end of semester department meeting.

1) Students' Viewpoint - Observations and Recommendations

a) The students' representatives felt that they had met the faculty outside the classroom on an equal basis.

b) Other students expressed their views and problems through surveys taken by the student representatives

c) There were improvements in courses made (or going to be made) due to student views

d) All major areas of study should have student-faculty dialogues either weekly or biweekly during the semester

e) Other science and math courses which the students are taking should be represented in the dialogues

FINAL REPORT

CORRELATION OF EXISTING OR NEW PROGRAM MATERIAL WITH EXISTING CURRICULA ON A RECITATION BY RECITATION BASIS

Ronald Holloway

FINAL REPORT: CORRELATION OF EXISTING OR NEW PROGRAM MATERIAL WITH EXISTING CURRICULA ON A RECITATION BY RECITATION BASIS.

I. MAIN OBJECTIVES.

The objective of this project was to facilitate instructor and students' efforts in finding supplementary resource material that would assist and reinforce the student's understanding in those areas of the curriculum where he was experiencing difficulty. Before supplementary program materials could be correlated with course textual materials, (Phase II - ~~see Exhibit 2~~), it was necessary to develop a step-by-step outline (Phase I - ~~see Exhibit 1~~) of the specific course (in this case a developmental elementary algebra course).

A. Phase I - The Outline.

1. Objectives.

The need for the outline was obvious from the inception of this project. For how was a student, who was experiencing difficulty with a particular part of the course material, to know where to look in the supplementary material if he was unsure of the structure of the course itself: So the initial goal or intent of the project was to provide each student with an itemized plan or overview of what was going to be covered and when. This "recitation by recitation" outline included a breakdown of topics (by chapter, chapter-section, and page numbers) and corresponding homework assignments (by page and problem number), which was given to each student at the first class meeting rather than dole this information out to him over the course of the semester. In addition to providing a base from which program material

could be easily correlated, it enabled students who were unexpectantly absent to stay with the pace of the lecture. The outline also provided those students who desired to "get ahead" with a means of doing so. Although student outlines can hardly be labeled an overwhelming innovative device, a few unexpected benefits were reaped from its usage. These included:

a. To Bore or Bewilder?

The entrance examinations given by CUNY and NYCCC created a new phenomenon in the developmental mathematics area. Classes contained students who had successfully passed high school algebra but failed the algebra part of the entrance examination, in addition to the student without any algebra background. The disparity of preparedness of the students was to cause a dilemma for many instructors as to how to pace the lectures--for if he taught to the level of the students who had had algebra, he would bewilder those who did not (the majority), but if he taught too slowly, he would bore the "repeaters." This problem was partially alleviated by offering "repeaters" the opportunity of independent self-study which the "blow-by-blow" nature of the outline greatly facilitated. This problem will be dealt with next semester by scheduling "repeaters" into special sections using programmed material with "multi-entry" and multi-exit" capability, so that only the deficiencies of these students are dealt with.

b. Loaned Instructors.

Open Admissions saw enrollment in developmental areas expand

inordinately while other areas in the college saw their enrollments decrease (at least initially) because developmental courses were now pre-requisites to traditional freshman courses. As a result, developmental areas were suddenly in need of additional instructors while traditional areas experienced staffing overages. Administratively these problems were mutually solved by scheduling instructors from areas where overages existed to teach developmental mathematics courses. Without commenting on the efficacy of this solution, I believe the "recitation by recitation" outline provides these loaned instructors with the type of detailed direction they needed.

2. Problems.

This phase of the project worked very well and overall student/instructor reaction to it was very good. The outline, however, as originally conceived, needs some additional polishing. Specifically the outline provided too much time for some topics and too little for others. Also the original testing schedule did not allow for the pre-election recess so subsequently the time duration between some tests was greater than desirable.

B. Phase II - Correlated Programmed Material.

1. Objectives.

The purpose of this phase of the project was to provide the student with supplementary program material which could include books, tapes, audio-visual material that was correlated directly to each recitation (already delineated in Phase I of the project). The original project placed two criteria on the type of program material. One, that it had to be self-instructional and two, that it be inexpensive. A third, unwritten, limitation became evident upon

starting the project: lack of sufficient time (approximately two weeks existed from last day of seminar to first day of classes to develop "recitation by recitation" outline, review, classify and reproduce enough copies of outline and supplementary programmed material for eighteen day and sixteen evening session classes). Considering the time limitations I decided to go with the best of the existing programmed material available in the Mathematics Laboratory facilities and use the fall semester to review and classify new material for spring semester.

2. Problems.

The problems experienced with this phase of the project can be categorized into three types.

a. Finding material that corresponded completely to textual material. The conceptual development and problem solving techniques of programmed material reviewed was not always consistent with the text book approach. Often students' "bootstrap" efforts were frustrated because of added confusion of different approaches.

b. Most of the existing programmed material reviewed that satisfied the self-instructional requirement had been designed to be used as an entity. That is, it was difficult to find material that would permit "multi-entry" and "multi-exit" utilization.

c. Although all students were given both the outline and the correlated listing of program material, at the first class meeting utilization of this material was almost non-existent (this was measured by reviewing Math. Lab. attendance records since all material was available only in the Math. Lab.). It was not until the first test did interest pick up.

Frequent short quizzes with diagnostic remarks referencing particular areas of difficulty with programmed material were then incorporated. Even then it was not until late in the semester did students use material on their own--they preferred to be directed by the instructor or a tutor to material rather than use the cross index themselves. I became convinced that frequent diagnostic testing should have been incorporated earlier rather than wait for first major test (3-4 weeks after the term began). Another problem related to this one was there were not enough copies of the programmed materials. Students were required to use material in the Math. Lab. since there were not enough copies to be loaned out for any period of time.

3. Some Solutions.

Problems a and b will be corrected for next semester because, with additional time, program materials by the same authors who wrote the text has recently been published. It has been reviewed and found to have "multi-entry"-"multi-exit" capability and is consistent with text approaches. Enough copies have been ordered to allow some limited loaning. The outline is being revised to allow for early and more frequent testing to permit early diagnosis and guidance for students.

A PROJECT TO INCREASE STUDENT AWARENESS OF HIS OWN EDUCATIONAL PROCESS

- Saul Levinson
Department of Mechanical Technology
Staten Island Community College Jan., 1971

OBJECTIVE

To help students understand constructively their own education

DESCRIPTION

A group of third semester students taking a course in Production Planning and Control were assigned term papers analyzing their own education - all of it, or a significant part of it.

The course is part of our curriculum in Industrial Engineering Technology which is the "easy track" option in the Mechanical Technology Department. The term papers were to make use of the techniques (or modifications of the techniques) covered in the course; these were sales forecasting, inventory management, inspection, production routing, scheduling and control. As an important tool in visualizing and analyzing the production process, diagrammetric and graphical methods were used. These methods were shown to be applicable to other situations such as the educational process. It was also indicated that a good study of education should include students' goals, preparation responsibility; the roles of the teacher, family, community etc.; the difficulties and how they might be corrected. It was expected that these analyses would help the students themselves as well as provide useful information for improving the teaching of these students.

While not originally part of this project, we also explored the use of student questionnaires in this and other courses. It was hoped that these could be used to increase student self-confidence in addition to the usual

evaluation of teaching and course effectiveness. This was done by asking leading questions relating, for example, their schooling to future job promotions and raises.

RESULTS and CONCLUSIONS

Students were permitted to choose their own topic for their papers. This was a mistake. We had anticipated that the better, more confident students would choose their subject and the poorer, less confident students would then ask for a topic to be given them - which would be their own education. What actually happened was generally that those students who had had job experience which gave them information useful for a term paper topic selected their subject accordingly; those without such job experience asked for the assigned topic. The latter group included both "good" and "poor" students. Some of the very good students without pertinent job experience were still able to find their own topics.

Out of a class of nineteen students, seven term papers on student education were assigned; five were completed; two have not yet been turned in but may yet be completed to remove grades of "Incomplete". Of the reports turned in, two were written by black students, who are mediocre, but not the poorest students; the other three were written by good students. The two overdue reports are owed by poor students.

Three of the papers covered high school experience. Two of these were written by the black students; the other by a student who was a real problem last semester but has now found himself. We cannot say that this latter student's improvement is the result of writing his term paper - he has been been better all term. Further probing into the reasons for his improvement

will be continued. In his paper, he emphasizes how his and his peers' attitudes hindered his schooling; even fine weather could keep him away from school. Both black students stressed the school's shortcomings; equipment, teachers and class size. They do not mention their personal or their community's problems. One of the blacks is quite intelligent, but very passive in class; the other has a very poor attendance record and is a father.

The two remaining papers treated community college education with comments on specific courses and their sequencing. They both feel that laboratory and theory courses covering the same subject should be given concurrently and not sequentially. One advocated a three year curriculum.

It is too early now to appraise the effect of these papers on the students themselves as these were end-of-the-term reports.

While it is also too early to evaluate the effectiveness of the student questionnaires, we plan to develope these as a continuing technique. Several valuable ideas were picked up - like the frequent use of short quizzes; these are definitely well received. Since students are relaxed and usually frank in questionnaires, these may have other uses, such pinpointing early in the term those students who are having trouble.

Minority Group Contributions to Technology--
Development of Teaching Materials

George Marshall

There were two objectives for this project. The first was to motivate and inspire disadvantaged students through the discovery of minority group contributions to technology in the past and present. The second objective was to help the faculty acquire information, and knowledge of available resources. This would enhance their ability to work with these students, and possibly increase their satisfaction with their work with the students.

I went to the Schomburg Collection on 135th St., and was surprised at the large amounts of material available. As was to be expected, there was considerably more material on science than on technology. One particularly useful volume is 'The Role of the American Negro in the Field of Science', by Dr. Louis Haber. This book was written for the U. S. Dept. of Health, Education and Welfare. Resource materials are well classified according to inventors, biologists, chemists and physicians. The references on inventors are particularly useful, since they include engineers and ingenious technicians. The number and variety of these inventors would be both surprising and encouraging to interested readers, and would help combat the primitive, narrow image of picking cotton and toting barges.

I have listed other books in the bibliography.

I attempted to integrate my library work with an investigation of the possibilities of student involvement. At the beginning of the term I sat in on a freshman class in electronics. The purpose was to establish a type of communication with this students in a classroom situation, which would not be possible if I were teaching the class. This made it possible to discuss, with relative freedom, the students' feelings about the subject matter, and their personal aspirations. The feedback to the instructor seemed helpful in pinpointing particular areas in which students were deficient, and also in pacing the instruction.

I thought it would be both enjoyable and educational for the students to become involved in research. The students thought so, too, but they found it impossible. The work involved in reaearch was in direct conflict with their course work. In fact, a considerable number of these students reduced their initial number of courses in order to maintain a passing academic level.

Most of the students felt it was important to develop some material, but they could not sacrifice the time. Even the suggestion of incorporating the research into

a social studies or English cours would not overcom the time problem, since it would require more time to complete meaningful research than to do the homework generally required in social studies courses.

In small groups of two or three, the students were both willing and eager to discuss their classes openly. No evaluation forms can compare with open and honest "rapping". A number of suggestions came out of these discussions:

1. Meeting with black students' organization. (I spoke to the faculty adviser for the Afro-American Club, and he was overwhelmingly enthusiastic about involving students in research on technology. Many black intellectuals are concerned about the anti-technology and anti-science feelings of so many young people. Black students have felt particularly discouraged in this area.)

2. Involvement of the student newspaper in reprinting an article on history. (I have available an excellent article from Product Engineering, 'Has History Been Obscured?' I am attaching a copy of this, as well as other articles, to this report.)

3. Converstions with faculty.

4. Student involvement in search for data.

5. Finding out about student experiences, expectations, and aspirations. The element of motivation in relation to achievement cannot be over-emphasized. Students could have the drive and determination to fully parici,ate in the mainstream of modern American life, if enlightened and inspired by the knowledge that so much of America's scene was his scene too. The black and Puerto Rican student who continually experiences many forms of discrimination needs to learn that there are more opportunities for him than he realizes.

Members of the faculty made suggestions. One was the involvement of some company in a survey of their black technicians and skilled workers. Their viewpoints on opportunities for minority students could be investigated, and some communication might be arranged between them and the students.

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Can 'cream-of-crop' recruit find happiness in big industry?

Mike Gallie picked AT&T from a whole slew of job offers. Now, after a year, he's still pleased with his choice, but the future is unsettled

One year ago, Mike Gallie won a B.S. in mechanical engineering from the Univ. of California at Berkeley. A strong but not brilliant student, Gallie was besieged with job offers at a time when college recruiting of engineering graduates was down. The reason: He was the only black student to earn a degree from the School of Engineering on the sprawling 27,500-student campus just when companies were pushing hard to capture minority-race grads.

Product Engineering, which last year followed his enviable task of picking a job from a goodly number of attractive offers (PE—July28'69,p21), talked with Gallie again recently to get his reflections after a year in industry.

With corporate life turning out to be everything he had hoped, 24-year-old Mike Gallie is still far from being a career man in industry. He has some reservations and, by nature, doesn't plan far ahead.

Relaxed and confident in his position of data systems design supervisor for American Telephone & Telegraph Corp.'s Long Lines Dept. in San Francisco, he says most of the promises that lured him to AT&T and away from seven other job offers have been fulfilled.

Not stereotyped. "When I first started work, I had guilt feelings that I had sold out to the big corporate giant," he says. "But business life isn't the stereotype people in Berkeley think it is. Even with 33,000 employees in our company, I feel there is real concern for the individual and also concern for social problems."

What are his reservations, then? While praising the company's awareness of social problems, Gallie feels its efforts are sometimes misdirected. An example he cites is a recent study of the quality of telephone service in ghetto areas.

"After months of study, the company came up with little more than what anyone on a ghetto street corner could have told them three years ago. The study was great, but there was no real progress or improvement made that I could see."

Hard to accept. Gallie finds it hard to accept things like this and admits he has a problem with what he calls his "impatience."

"My impatience sometimes gets in the way, but luckily I am always able to question things. The door to my boss's office is always open, and if there is a problem, it usually gets straightened out because the lines of communication are open."

Gallie currently has two supervisors and a total of 15 people reporting to him. He is responsible for the company's computer hardware and software, and he supervises all the data-processing functions for AT&T's Western area (11 Western states). He also is studying the company's future needs in computer systems and helping develop new programs.

This is all part of his job under the company's initial management-development program designed to groom college graduates for middle-management positions over a 4- to 5-year period.

"The company talked with me just after I was hired, and they tried to match my interests with the job availability," says Gallie. "The job is just what I wanted: systems work and immediate responsibility."

Too happy? In fact, Gallie feels he may be a little too happy with the job, because under the company program, he'll have to move to another area before too long. "It's going to be hard to compensate for the amount of responsibility I have now, but I guess exposure is important."

One discouraging thing Gallie has learned is that if he stays with AT&T he will have to spend 18 to 24 months on a "headquarters assignment" in New York.

"There is nobody high up in the area who hasn't spent some time in New York," he says. "It's expected that if you plan to get anywhere, you have to go to New York for awhile and work in the corporate headquarters."

Gallie has done a lot of traveling during the year, and he talks with reserved amusement about his introduction to many supervisors in the company's other regional divisions.

Awkward moment. "When I go out of town to a meeting and I show up as the representative of the Western area, there is more than a little surprise," says Gallie. "And if I have talked with them over the telephone before we meet personally, there is always that awkward moment of readjustment."

Gallie feels the social relevance of his being in a position of responsibility is more important than any one function he performs in carrying out his assigned tasks.

'It's important both for blacks to be able to identify with someone in a position of authority and for whites to see us too'

"There are only two black managers in the San Francisco headquarters," he says. "There may be a couple in sales managerial positions in the Los Angeles office, and there is one in the Denver plant, but that's all I know of.

"I think it's important not only for blacks to be able to identify with someone in a position of authority, but also for whites to see us too. At the present time, the number of minority employees outside the plant area is very low."

Haunted by draft. One of the problems that plagued Gallie as a student was the draft, and it continues to haunt him despite his success in industry. His job with AT&T doesn't carry a 2A job deferment, and he drew number 79 in the draft lottery last July. Currently, he is appealing his 1A classification, but as he puts it, "Uncle Sam is pushing hard."

"It's really hard when you're trying to work out your future and you have the draft to contend with," he says. "I'm still not sure what I'll do if I get drafted."

While he is honestly and deeply opposed to war, Gallie felt he could not

onestly apply for conscientious objec-
or's status. But with the recent Supreme
'ourt decision broadening the quali-
ications for CO exemption, he now feels
.e might.

A move to Canada is another possi-
ility. "I just won't know until the time
omes what I'll do."

While at Berkeley, Gallie was active in
ocal minority self-help educational pro-
rams, including Upward Bound. But
ow, travel combined with the long work
lay has cut short this activity.

"I'm still working in the Upward Bound program, but only in a limited way," he says with some regret. "I've had to give up the tutoring because it just wasn't fair to the kids. They'd have a big test, and I'd have to be traveling at the same time. It just didn't work out."

'I find I really need it.' Gallie has been taking business courses in the evenings at the Univ. of California Extension, and he is toying with the idea of going back to business school to earn an M.B.A. If so, he would take a leave of absence from AT&T.

"Last year, I decided against business school because of the draft, but after a year on the job, I find I really need it. Just the courses I've had at night have really helped me in my work," he says. The combination of self-confidence and the many alternatives for the future keep Gallie from planning very far ahead.

"Things have really worked out well for me here so far," he says. "But if you asked me if I will be here 10 years from now, I just couldn't say. I don't want to get too security-minded or materially tied to my job. I see guys who are so deep in debt they can't afford to leave."

Gallie knows if he stays with AT&T he will eventually have to leave the Bay area, but he is mainly concerned with the short term.

"And for the next year at least," he says, "you couldn't pry me out of San Francisco." [7.1]

Tyler Marshall, San Francisco

A good idea for inventors but it didn't quite pan out

The Regional Development Laboratory (RDL), a unique experiment in helping inventors develop their ideas, will be closing its doors in mid-August because of lack of funds and the difficulty of finding good ideas from inventors.

Established in May, 1965, RDL was conceived as a place where inventors could go on weekends and in the evening to work out the details of an idea. The lab provided a place to work, some machine-shop equipment, and, as the idea matured, guidance on the business details of establishing a company to produce the product. The hope was to find inventors who, given the opportunity, could create new businesses that would provide jobs for unemployed people in the Philadelphia area.

Where are the idea-people? But RDL did not work out that way. The problem, it turns out, is in finding people with ideas, who know the value of an idea, and are sophisticated enough to know the potential market for the invention, according to J. Alexander MacMurtrie, executive director of RDL.

In his two years with the lab, MacMurtrie has found it difficult to provide standard promotional techniques to the lab itself. Private business says that when it employs a man, it wants him to think about the company's products, not about his own. They just don't want the brainpower of their manpower diverted to outside uses.

"Our mission is not to help the gadgeteer," MacMurtrie explains, "or the chap who is employed by a major corporation. An engineer in a large company usually can find some way to develop a prototype and perhaps find financial backing to market the product."

Benefactors. For the first three years of its existence, RDL received funds from the U.S. Dept. of Commerce. Then the lab was funded by the Pennsylvania Science & Engineering Foundation, an agency under the state Dept. of Commerce. The lab also has three local sponsors: Southeastern Pennsylvania Economic Development Corp., West Philadelphia Corp., and the University City Science Center. The foundation contributed two-thirds of the funds and local sponsors, the remaining third. The state is dropping out this month.

If a way could have been found to cut overhead, perhaps the lab could have remained open. MacMurtrie proposed that the lab be taken under the wing of a large organization, the University City Science Center. But the science center is struggling to stay alive and grow itself. It depends on rent from its own facilities to pay expenses and could not put aside square footage for RDL.

While everyone is interested in the concept of RDL, no one in the various states or in the federal government has found the best mechanism for fostering invention, MacMurtrie points out.

Swedish solution. "I think we'd work better under a modification of the system that the Swedish government uses, which employs evaluators of ideas," says MacMurtrie. Harald Romanus, consultant with the Swedish Board of Trade in Stockholm, advises inventors where to sell, explains MacMurtrie, who has met and talked at length with Romanus. Romanus has worked up a list of industrial contacts in his country who let space to an inventor to develop an idea to prototype stage. Romanus picks out a company with a product line similar to the proposed invention, and then he contacts that company to secure working area for the inventor.

Perhaps RDL could be successful if it were set up in this way, MacMurtrie suggests. Funds could come from an agency that would stand to benefit from the new product: The federal and state governments, for example, would receive additional taxes from the new businesses, and an electric power utility would be able to sell additional power.

A local chamber of commerce or an organization such as the Philadelphia Foundation (which receives legacies from individuals) could set up the fund. This group could publicize the fact that a board to review promising ideas would sit once a month. The board would decide if it should rent space in an industrial park and lease equipment to develop an approved idea.

This mechanism would eliminate the need for both standby equipment and the salaries of administrative personnel, MacMurtrie points out.

Successes. RDL has had enough successes to prove its worth. Since it began, about 20 companies have formed or are being formed, representing about 200 jobs. RDL has received about 530 requests for use of its facilities.

When RDL accepts an idea, it asks for 5% equity interest in the project when writing a service contract. In return, the inventor gets use of the facilities and equipment.

One of the companies it helped spawn is Data Presentation Corp., which handles the overflow of data-processing work from companies. There had been no outfit like it in Philadelphia before. Since then, the owner has expanded into other areas of data processing.

Another inventor developed aircraft instruments, such as an altitude encode for private planes. One inventor has put together and sold several systems for

Cover story

A black engineering graduate discovers he's the cream of the crop

To be "young, gifted, and black" still spells nothing but frustration in many walks of life. But to be the only such young man newly graduated from an engineering school is to be the cynosure of industry's eyes.

That is what 23-year-old Mike Gallie (cover) found out this June, when he was awarded his B. S. in mechanical engineering from the Univ. of California at Berkeley. A strong but far from straight "A" student, Gallie received far more attention from campus recruiters than did most of his fellow graduates, even those with the highest grades.

Apparently what attracted the companies was that Gallie was the only black student to earn a degree from the engineering school of the 27,500-student campus. He also had an edge on many fellow graduates because he participated in the school's work-study program.

Discrimination in reverse. Gallie's experience isn't unique for black engineering graduates, especially on the West Coast. Industry is searching them out and offering lucrative packages to win them from the competition. Gallie has fielded these offers deftly and thoughtfully.

In addition to numerous feelers, he received eight definite job offers from some of the largest corporations in the country. After considerable thought, he decided to accept the offer from American Telephone & Telegraph in San Francisco. This job, he felt, would give him responsibility, challenge, and the potential to advance. "And my interviews with them were excellent," he adds.

One foot in the world. The year and a half of work experience Gallie had through the school's work-study program stood him in good stead. Under the program, a student studies for six months, then works for six months, getting practical experience in his field. Gallie worked for North American Aviation, Los Angeles; Texaco, Long Beach; and, in his final year, for Colgate-Palmolive Co., Berkeley.

"One of the main reasons I came to Berkeley was for this work-study program," Gallie explains. "You can help put yourself through school and get experience in your field at the same time."

Interview practice. He worked from June to December and attended classes from January to June. In addition to on-the-job experience, the program familiarized Gallie with interview situations.

"So when I went into an interview after graduation, I knew more or less what I was after. I wanted to have some mobility in a job so that I wouldn't be tied to a desk. I also wanted to know if I could move up in a company. I don't have any desire to be chairman of the board, but I do want to have responsibility."

Money and job location were also on Gallie's list, but money was one of the last things he mentioned. "Of course I don't want to starve to death, but if everything else were right, I'd even have taken a job that paid less."

A huge stable. Gallie was favorably impressed by most of the company recruiters, with a few exceptions. "In one interview with an aircraft company, I realized as soon as I went in that I had a job and I simply had to choose where I would work. I felt I was being put in a huge stable."

Like many of his fellow graduates, Gallie faces an agonizing decision about the draft. Very eligible but equally reluctant, he is uncertain what he will do when the time comes.

"I won't go to jail, and leaving the country would be just like giving up 23 years of my life," he says. "When

104

102

Cover story *continued*

I was looking for a job, one of the first questions I asked was 'Could they give me a deferment?' Rumor has it that 2-A deferments aren't given except for defense-oriented jobs, but I know people who got them, and they won't be working in defense. I'd like to apply for a C.O. status, because that's how I really feel. But I know I would have a hard time writing the kind of letter it takes to get it."

Narrowing down the field. During the past year, Gallie had interviews with 25 potential employers. Of the eight concrete offers, he rejected five without much trouble. He had a good offer from General Electric, but he disliked its three-year training program, which called for a mandatory move each year. "I want to move around in a job," he explains, "but the idea of a compulsory move each year just didn't appeal to me."

Gallie also turned down FMC Corp., despite the possibility of heading up a minority recruitment program. The reason: He didn't want to be associated with a company that was producing military ordnance. Other offers from the Dept. of Housing & Urban Development, Colgate, and U.S. Steel were also rejected. But a decision became much harder once the field has been narrowed to three.

Uptight areas. "Texaco Oil Co. presented the best money offer, and the job not only was interesting but would take me out in the field quite a bit. However, I was concerned about the growth potential of a black employee. I would be working in 'uptight' areas and was worried about being a supervisor in the field."

Gallie also received an excellent offer from Kaiser engineers to join their computer-systems group. But, all things considered, Gallie opted for AT&T.

"AT&T seemed to be the only company that knew what I meant when I said I was worried about growth potential," he says. "Most either ignored the subject or didn't know what I was talking about. AT&T also gave me immediate responsibility in the computer-systems department. There is a year's training period, but it's a sink-or-swim proposition. I'm starting the job somewhat earlier than I had planned, because I'm pretty excited about it."

Gallie describes all his interviews with AT&T personnel, both on the campus and at their offices, as "excellent."

"I was able to talk with many different people and got a good across-the-board feel for their operation. It was a strenuous day, but after it was over, I felt I had been challenged and so had they. AT&T also had a good followup. "About every two weeks, they wrote to ask if I had made a decision yet, and generally kept in touch with me."

Management-oriented. Gallie is probably more management-oriented than many engineering graduates are, and he hopes to become involved in job-training programs. He was active in the Upward Bound program while at Berkeley, teaching math to high-school students. The program is geared to upgrading the education of children from ghetto areas.

"The program is great," says Gallie. "The only trouble is that we aren't reaching enough kids."—*Tyler Marshall, McGraw-Hill World News, San Francisco*

105 103

Industrial grant encourages Negroes to study engineering

Negro students are being encouraged to study engineering under a new program involving Atlanta Univ. Center, Georgia Tech, and the Olin Mathieson Charitable Trust.

Students will study at one of the undergraduate colleges of Atlanta Univ. Center for three years, then take two years at Georgia Tech. They will get degrees from both.

Industry supplies funds. Olin Mathieson Charitable Trust is providing $265,000, to affect about 85 students over the next three years. The money will go, in part, toward support of an adequate administrative staff at both Atlanta Univ. Center and Georgia Tech, which will seek and encourage youngsters from low socio-economic areas of the region to plan for an engineering career.

The rest of the funds are slated for scholarships for qualified students. These funds are to supplement government aid or replace it where students cannot get government support.

Closes the gap. Atlanta Univ. Center includes four predominantly Negro colleges: Clark, Morehouse, Morris Brown, and Spelman. All are within 1.5 mi. of Georgia Tech.

Georgia Tech has found similar ties with other schools in the southern region: Univ. of the South, Davidson, Univ. of Chattanooga, Southwestern at Memphis, and the Univ. of Georgia. These earlier experiments have not been too successful —mainly because the schools are geographically so far apart.

In announcing the $265,000 grant, Gordon Grand, president and chief executive officer of Olin Mathieson, explained:

"We view this program as a particularly appropriate way to achieve three major objectives: It will enable Negro students to receive their technical training at one of the nation's finest engineering schools, without severing their relationships with their undergraduate colleges. It will bring the white and Negro institutions of higher learning into much closer collaboration, to the advantage of both, and it will significantly increase the number of qualified Negro engineers available to industry."

Traditionally, Negro college students have found themselves limited to teaching, medicine, the ministry.

"In an era when technology is a central factor in society, it is significant that a serious attempt is being made by these two universities to prepare Negroes for leadership in engineering," says Dr. Albert E. Manley, president of Spelman College and chairman of the Council of Presidents of the University Center.

"The dual-degree characteristic insures the student a sound liberal arts background before concentration on technical studies, and effective leadership requires such a broadly based program," he concludes. **(7.28)**

Czech digest folds as government reins tighten

For 10 years, Czechoslovakia's English-language monthly, *Technical Digest,* has been for Western technologists a primary source of information about events in Eastern Europe. It is a publication rare in the Communist world: It provides a relatively deep look into Eastern engineering and science.

With last month's issue, publication of the journal ceased.

In the wake of Warsaw-pact intervention in Czechoslovakia, the magazine had missed two issues, but its demise came as a surprise. In a caustic and bitter, but moving, farewell, its editor, Dr. Jiri Hruska, offered some reasons. His text appeared in the last issue:

"Dear reader:

"This is the last issue of your *Digest* that you will receive. Sorry about it. We prided ourselves on maintaining a steady (if not always adequate) trickle of technical information over all the ups and downs of the last decade, across a curtain which at times was very iron indeed; and until fairly recently we held high hopes of making this service of ours really worthwhile to you. Well, that is off now. Can't be helped.

"We cannot very well enlarge on the circumstances which have forced us to wind up just now. You will have formed some picture of them from the fact that you got your last three copies with a considerable delay, and that they were not up to our usual standard. (For both of which we apologize, as being beyond our control.) But we can tell you quite honestly that there would have been some substantial changes anyway.

"The *Digest* was founded 10 years ago with the proud title of *A Monthly Review of Science & Technology in the Socialist Countries.* Cooperation with some of the other countries for which we professed to cater was never all that it should have been. And even in our own country, nonsensical 'security' considerations often kept the best material out of our reach. Still, in those days, there was practically no other source. If you wanted the news, you got it from the *Digest* simply because there was no serious competition.

"Nowadays, more and more countries, industries, and firms are putting out their own English-language periodicals. So there is less need for a single all-embracing publication like the *Digest* which, while better than nothing at all in its day, was never anything but a stopgap effort. There may, however, be a niche for a successor journal—for a paper that will more openly and boldly tread the path onto which we were finally pushed by the force of circumstance: a review of Czechoslovak engineering technology. Such a scheme is under consideration. And any comments you have on it will be sincerely welcome, especially if they help to assess the size and shape of the market for such a periodical.

"For the time being, we can only thank you for sticking with us through all the thick and thin (more thin, unfortunately) of the past decade, and hope that the old *Digest* has been some use to you. As for the rest—well, we are not dead yet. You may be hearing from us in the reasonably near future. The editor."**(7.7)**

Group analyzes market, then plans the product

Stanford Research Institute (SRI, Menlo Park, Calif.) has launched a program designed to give clients a thorough grounding in economic information before they embark on new-product-development efforts or in major expansion.

A short time ago, a company's man-

Interesting to note

A man for charting all seasons

Benjamin Banneker (1731-1806) was in his late 50s when he took up the study of astronomy; by the time he was 61—just about today's retirement age—he had won respect both as an expert astronomer and as one of the foremost almanac-makers of his day. Public recognition of his skill in these two areas was heaped upon the acclaim he had already received as a brilliant mathematician.

Banneker was largely self-taught in mathematics, for his formal education ended at today's equivalent of eighth grade. Nevertheless, by the time he was in his 20s, knowledge of his ability to "calculate" had spread far, and scholars from many parts of the country were sending him their difficult mathematical problems. It is said that he solved every one and often sent back an original question in rhyme. For example, he sent this one printed here in part) to George Ellicott, a long-time friend:

". . . Then," says the Vintner, "you're the man for me—
Make me a vessel, if we can agree.
The top and the bottom diameter define,
To bear that proportion as fifteen to nine;
Thirty-five inches are just what I crave,
No more and no less in the depth will I have.
Just thirty-nine gallons this vessel must hold,
Then I will reward you with silver and gold . . ."
So the next day the Cooper, his work to discharge,
Soon made the new vessel, but made it too large;
He took out some staves, which made it too small,
And then cursed the vessel, the Vintner, and all . . .
Now, my worthy friend, find out if you can,
The vessel's dimensions and comfort the man.

Clock sets standard. Mathematics was not just mental exercise to Banneker; he found it practical. At the age of 30, he planned and completed construction of the first entirely American-made clock. His only tools were a watch, which he used as a model—he had never seen a clock, and there was not one within 50 mi. of his home—and a small pocket knife with which to fashion each piece. The clock, one of the wonders of his day, stood as a standard of timekeeping, striking the hours with faultless precision for 20 years. (For a look at today's keeping of standards, see page 19.)

Banneker's reputation as a mathematician earned him a place on the commission appointed by President George Washington to complete the survey and lay out the District of Columbia. It is said that the commission chairman, Major Pierre Charles L'Enfant, was given to fits of temperament. When the major suddenly resigned and shipped off to France, he took all the plans with him. But Banneker's knowledge of the calculations and his unusually retentive memory enabled him to reproduce the plans in detail.

Culver Pictures, Inc.

Banneker is remembered historically for his role in laying out Washington, D.C.

George Ellicott, son of a wealthy Quaker, first interested Banneker in astronomy. He lent his friend a number of mathematical books and instruments, among them: Mayer's *Tables,* Ferguson's *Astronomy,* and Leadbetter's *Lunar Tables.* Banneker mastered them so thoroughly that he detected errors in Ferguson's projection of the solar eclipse of 1789, then correctly projected the eclipse himself.

Something for everybody. His study of astronomy led naturally to writing an almanac—then the most comprehensive medium of scientific information—for the astronomical calculations needed only to be extended. The first almanac, covering 1792, is a formidable collection of something-for-everybody, according to the front cover:

"Benjamin Bannicker's (*sic*) Pennsylvania, Delaware, Maryland, and Virginia Almanack and Ephemeris, For the Year of our Lord, 1792; being Bissextile, or Leap-Year, and the Sixteenth Year of American Independence, which commenced July 4, 1776. Containing, the Motions of the Sun and Moon, the true Places and Aspects of the Planets, the Rising and Setting of the Sun, and the Rising, Setting, and Southing, Place and Age of the Moon, &c.—The Lunations, Conjunctions, Eclipses, Judgement of the Weather, Festivals, and other remarkable Days; Days for holding the Supreme and Circuit Courts of the United States, as also the usual Courts in Pennsylvania, Delaware, Maryland, and Virginia.—Also, several useful Tables and valuable Receipts.—Various Selections from the Commonplace-Book of the Kentucky Philosopher, and American Sage; with interesting and entertaining Essays, in Prose and Verse—the whole comprising a greater, more pleasing, and useful Variety, than any work of the Kind and Price in North-America."

Like all almanac-makers of that day, Banneker undertook to forecast the weather for every day of the year. His prognostications for the month of June, 1792, present a sample of those set down for each of the 12 months:

June 1	Sultry	June 16	
2	and	17	
3	dry,	18	clouds.
4	close	19	
5		20	Clear and
6	weather,	21	Warm.
7	followed by	22	Very
8	thunder	23	
9	and rain.	24	
10		25	sultry.
11	Cool	26	Clear
12	breezes	27	and hot
13	with	28	weather.
14	flying	29	
15		30	Rain.

Banneker continued to study astronomy and observe natural phenomena, which he incorporated into the almanacs he issued annually until 1802.

—*Carol E. Brooks*

Interesting to note

Has history been obscured?

On July 25, 1916, an explosion trapped a dozen men in Tunnel No. 5 of the Cleveland Waterworks. The men were 228 ft. below the surface of Lake Erie, and the tunnel was filled with gas and smoke.

Officials of the waterworks summoned a long-time resident of the city, Garrett Morgan, with his newly invented "gas inhalators." Morgan, his brother, and two other volunteers donned the gas masks and were able to descend into the fumes and save several of the men.

When word of the incident spread, orders for the Morgan inhalator began to pour in from fire companies throughout the nation. But after a while, many orders were abruptly canceled. Was the story a hoax? Was the gas mask not the life-saving device it seemed? Did Morgan, after all, not possess the legal patent rights? None of these. Morgan was a Negro.

A blind attitude. Garrett Morgan was just one of more than a thousand black inventors who have obtained U.S. patents for their ideas. And he was one of the better known and more successful. In 1923, because his reputation had been established with the gas mask, Morgan was able to command $40,000 from the General Electric Co. for his automatic traffic light. Others were not so fortunate.

In today's market (surveyed in this issue's special report, page 98), Garrett Morgan would not face the same blatant prejudice. Yet, even today, many persons are unaware of the contributions made by Negroes during the Industrial Revolution.

Coupler for rr cars. Another successful Negro inventor was Andrew J. Beard. In 1897, he received $50,000 for a device that automatically coupled two railroad cars by merely bumping them together.

While working in an Alabama railroad yard, Beard had all too often seen men lose limbs—even lives—trying to couple cars manually. In this split-second operation, a man had to drop a metal pin into place just as two cars crashed together.

The deaths and maiming accidents that Beard's invention, called the "Jenny Coupler," has since prevented are countless.

Earlier than Edison. Another Negro inventor who contributed much to the railroad industry was Granville T. Woods. During his lifetime, Woods obtained some 50 patents, many purchased by Bell, Westinghouse, and Edison. Woods is best known for his automatic air brake and for a telegraph system to send messages between trains.

In two patent cases against the Edison Co., Woods proved that he had earlier rights to inventions claimed by Edison. Edison was so impressed after the second court victory that he offered the inventor a position, but Woods declined.

Granville T. Woods, one of the successful inventors in the Industrial Revolution, earned more than 50 patents.

Lighted New York. When Alexander Graham Bell wanted to draw up his patent application for the telephone, he called on one of the best patent lawyers of the day, Lewis H. Latimer, a Negro born a freeman before the Civil War. Though not actually a lawyer, Latimer had years of patent experience with a legal firm and was a qualified electrical engineer.

Several years later, Latimer left Bell to join the U.S. Electric Lighting Co. in Bridgeport (Conn.). There, with another noted inventor, Hiram S. Maxim, Latimer invented the first incandescent light bulb with a carbon filament.

Later, Latimer joined the engineering staff of the Edison Electric Light Co. It was he who supervised the installation of lighting in New York, Philadelphia, and London.

The shoe industry. In 1870, an 18-yr.-old machine-shop worker named Jan Matzeliger emigrated from Dutch Guiana to the United States. He was lucky enough to land a job in a shoe factory.

During the next decade, the Industrial Revolution produced several machines that could perform individual shoe-manufacturing operations. But in 1883, Matzeliger received a patent for a machine that could produce practically an entire shoe in one minute.

The invention was purchased by Sydney W. Winslow, who, with this shoe-lasting machine, established the United Shoe Machine Co. Matzeliger died at the age of 36, long before he had a chance to share in the enormous profit.

These early black inventors are just a sample of the Negroes who have contributed to America's development. Others produced even more familiar, if less significant, innovations—the potato chip, ice cream, the player piano. Some certainly have been even more important—blood plasma, modern sugar refining. But one thing is certain: George Washington Carver was not the only Afro-American who has earned a place in the history of this country. **(7.4)** *—A. J. Parisi*

Numbers in heavy type are index code numbers. For a copy of index code, circle 600.

1970 SUMMER INSTITUTE

IMPROVING SKILLS IN WORKING WITH DISADVANTAGED YOUTH

James J. McGrath

January 23, 1971

PROJECT TITLE: Preparing Students to Develop and Teach a Lesson.

OBJECTIVES: The major objective of this project was to prepare a student admitted to New York City Community College under the City University's open enrollment program to plan and teach a fifty minute lesson in order to determine if this experience would:

1. Raise the level of self-confidence of student teacher(s).
2. Re-inforce the learning for student teacher(s).
3. Provide student teacher(s) with an appreciation of the instructor's task.
4. Improve the learning atmosphere in the classroom.
5. Interest other students to act as teachers or tutors.

Description of Project: This project seemed to best lend itself to instruction in the area of Business Mathematics because in this subject there are topics of varying length and difficulty. Therefore, a freshman class of students in Business Mathematics was chosen for this project.

The students in this class were given a pre-test to determine the range of their abilities in arithmetic computations. The pre-test is composed of such arithmetic items as: addition and subtraction, multiplication and division of decimals, fractions, percents, and other basic skills. The range of scores was 28% - 95%. The scores were distributed

in the following manner:

below 40% - 1	70% to 79% - 6
40% to 49% - 3	80% to 89% - 2
50% to 59% - 9	90% to 100% - 3
60% to 69% - 4	

Students with grades below 70% on the pre-test were invited (really urged) to attend early morning (8:30 - 9:30 A.M.) tutoring sessions. These sessions were held three days a week for one month. Only about five students attended regularly. From this group one student was selected (without his knowledge) to become the student instructor.

The student was a black, male. He was highly verbal. In the small tutoring session he was encouraged to assist other students in learning the basic skills. He became almost an assistant tutor in a one on one situation. At the same time, he was called upon frequently in class to answer and explain points.

After a considerable period of time (approximately in the eighth week) he was asked if he would like to teach a small portion of a lesson to the entire class. He was less than enthusiastic about the idea, but after some discussion accepted the idea of studying a portion of a lesson to be presented near the end of the term and preparing class notes on the subject. He did this and the topic and the notes were

discussed with him. He then taught this lesson to a group of four students in an early a.m. session successfully. Then finally gave a fifteen minute class presentation of this lesson on the discounting of notes receivable.

Results and Conclusions: The object of this project was to prepare a high risk student to plan and teach a fifty minute lesson. It was not possible to accomplish this in one semester in this project, and I have some doubt if it would be possible even over two semesters. In addition, I believe that an inordinate amount of time was spent in preparing only one student to teach before a class for approximately ten to twelve minutes. I now believe that this time could be better spend in the small group tutoring sessions.

However, the results of this project were not entirely negative. Some of the positive results were:

1. students did accomplish a great deal of additional learning in the tutoring sessions. This was probably the single most important aspect of the project. These students who attended the small group sessions did well in the course. All completed the course with grades of C or better.
2. the student who acted as a tutor and as an instructor relates that he is more confident of his own abilities. He also reports that studying

lessons in order to teach them to someone else helped him learn better because he was more conscientious in his preparation. He also relates that he enjoyed the experience, but seemed to learn as much in preparing to tutor as to teach.

3. the students in the class felt that the tutoring sessions were good (even though the majority did not attend). They also expressed the opinion that while the student teacher did a fine job they did not feel that it added or detracted from the course.

Recommendation for Future Action: In similar classroom situations in the future, the major aim will be to organize small group sessions with student tutors on a rotating basis. A minor aim would be to prepare a student to teach a segment of a lesson if he or she desired to do so. In this manner, I feel more assistance could be given to students that could be classified as high risk students.

NEW YORK CITY COMMUNITY COLLEGE
of the City University of New York

1970 Summer Institute For Two-Year College Faculty on Improving Skills in Work with Disadvantaged Youth

Urban Youth Views Technology

An Educational Project

Fall Semester 1970

Prof. John L. Mueller
Department of Mechanical Technology

Urban Youth Views Technology

Prof. John L. Mueller

Objectives

It is well known that students, especially those in the category of the so-called disadvantaged, often have great difficulty in relating their thoughts and ideas with faculty members. This project, which resulted from the EPDA Summer Institute, was created to help diminish those difficulties. In addition, The project had the objective to introduce the student to the obligation he has as a technologist to his community.

Project Description

This project involved freshmen students enrolled in TF - 100, Careers in Technology. A course which is principally concerned with informing the students of the various fields of technology. After three weeks into the TF - 100 course, I directed the class discussion to problems that existed in the city, in the urban slum and in area in which the students lived. At first many of the students felt that the problems were "social problems" and were unrelated to technology or engineering. This opinion soon changed. When I asked a student who had indicated that he lived in a ghetto, what he found wrong with his neighborhood, the reply would typically be, "the streets are dirty," or "too many rats" or "too much noise". The group became very vocal at this point in describing how deteriorated the street actually was. Since the student is very knowledgeable regarding his neighborhood and also because this discussion was quite novel

for him, he became very active in outlining the problems he had to live with.

The student stated the problems in very general terms. By introducing the question - Why do these problems exist ?, or,Exactly why are the streets dirty ?, I had guided the student into probing for the actual cause of the various problems. Through a question and answer technique, often at a rapid pace, the problem description changed to more detail: The plastic garbage bags are not strong enough; Lights on my block are always broken; the garbage trucks don't pickup the trash on time and so on.

Enthusiasm was high. The students seemed to enjoy bettering the other's problem. They also appeared to be somehat astonished that I, a faculty member, was interested.In the TF 100 classroom, after discussing briefly some of the fields of technology, I distributed a questionaire to all the students, asking two questions:

1.What problems exist on your street that you feel engineering and technology can help solve?

2.Since you are entering the engineering world, do you think that you will be able to solve some of these problems ?

A space was provided where the student indicated his neighborhood. I gave sample situations for question No. 1 to guide the student but I deliberately left the interpretation to No. 2 open. Many students listed a number of problems that resulted from a careful observation of the street. However, the answer to question to No. 2, for the majority of the papers, indicated little comment. I was looking for some disclosure that would show some thoughts the student might have regarding his future professional growth. Typically the answer was," Yes, Maybe.".

An important benefit of the questionaire was that several students wrote that they may be in the wrong curriculum. With this information, I was able to invite those students to discuss with me what they had in mind,if anything,for a professinn. I learned that for many, Design Drafting (their present curriculum) was a second or third choice. It became necessary to counsel the student and also suggest other counseling that would be applicable.

In TF - 100, I informed the students of the types of problems that were disclosed by the questionaire and then discussed the various steps involved in formulating a design or a solution to a problem. I covered aspects of problem definition, data gathering, and some aspects of brainstorming sessions. I did not emphasize technical rigor, because to do so at this point in time, when the student is poorly prepared, would result in a loss of student interest.

The final step in this endeavor was the Design Project. To induce the student into making a small survey or study of a particular problem and provide a solution in the form of a report and a drawing, I offered an exemptinn from the final exam in TF - 100 for those who submitted good papers. I did not demand a precise pattern or format for the nature of the report or the drawing. The only request was that it was to be "professional". My feeling was that too many instructions and restrictions would tend to turn off those that were interested. I sugested that the presentation be in the following general form.

1.Problem definition.

2.Drawing of design and/or problem.

3.Description of the design together with advantages.

After assigning the project, I would meet infromally with groups of students, usually in numbers ranging from two to five. They would come to see me after they had been discussing a possible idea during lunch or some break. This Design Project discussion opened the way for another discussion which might start with my casually asking a student how he was progressing. The student, more relaxed now, would be quite frank regarding where he stood. Sometimes this discussion would result in a solution to a math problem or a comment on the Coop program or possibly an answer to a question pertaining to after graduation. A great number of designs were submitted. See Appendix. Many of these are not at all feasible but because of the high pride indicated by the student I minimized my comments regarding the design's practicality. The other students would comment on the various designs often suggesting improvements or other solutions. This tended to create some rather good brainstorming sessions. Many of the ideas are clearly ingenious and very clever. While some of the papers submitted were poor attempts to obtain an exemption, the results show that a high degree of interest and pride was developed in the student.

Conclusions

This project was a success because it achieved the following:

1. It illustrates a way in which we as faculty can improve our relationship with the students. Demonstrating that often an indirect approach to a student with a topic of great interest to him oftens results in a better rapport.
2. Provided the student with a greater understanding of the problems that exist in his local environmeht.

3.Introduced the student to the idea that he can help,through the use of technology, to reshape the urban neighborhood.

Suggestions

A design course should be created that offers the student projects that he can readily relate to. It may be a problem which involves the poor conditions of the ghetto. If this course were given later when the student has a greater technical and scientific knowledge, the results may be quite useful, even spectacular. His thinking has more freedom of movement and he is more aware of the world he is trying to improve.

An important suggestion to note is that initially, when presenting the study, avoid requesting formal presentations. Once the student finds himself involved, he will work towards providing a professional presentation.

THE EFFECT OF A COOPERATIVE EDUCATION PROGRAM UPON TECHNOLOGY STUDENTS

Lawrence M. Seigel

OBJECTIVE: To ascertain the effect of a Co-op experience on the students academic achievement, behavorial attitudes and expectations.

In order to evaluate the program the following steps (procedures) were to be used:

1) compilation of student employer evaluation reports.
2) students personal assessment of Co-op experience.
3) teachers assessment of student.
4) students academic reports.

The Co-op program in technology began in September 1969. Since then approximately eighty students have been placed on Co-op assignments, with over 75% of these students receiving offers of permanent employment upon graduation from the companies with which they had their Co-op experience. An ethnic breakdown shows twenty-four Blacks, eleven Puerto Ricans, two Orientals and forty-three Caucasians of various denominations have todate participated in our program.

The following is an evaluation of the program which included interviews with all employers, teachers directly involved with the program, and with fifty of the eighty participating students.

Employer Evaluation

Employer reports (attached) show that 96% or forty-eight of the Co-op students established a satisfactory working

relationship with their co-workers and supervisors, and positive attitudes were shown towards their assignments. The employers stated that forty-seven of the fifty students rated were capable of making job oriented decisions, while only three students were considered to use poor judgement in this area. Further, all but two students were found to be dependable on the job with these two being judged somewhat careless in their work habits. Employers considered all but one student to be average or better in their ability to learn their job. The overall rating of all students by their employers was regarded from average to excellent.

Student Evaluation

The students found their work assignments interesting, but in some cases, did not feel the work to be sufficiently challenging. Some of their comments were: "the program would be more successful if a more technical exposure were possible on the job", "my school background was not exploited sufficiently", and "frequently the job was not as technical as desired". Job assignments were directly related to the students field of study. Some typical assignments were:

a) Chemical Technology - students performing water and fuel analysis in industrial laboratories.

b) Construction Technology - students doing structural drafting, estimating and surveying.

c) Mechanical Technology - students testing power supply sources, trouble shooting various equipment, and designing diverse systems.

Though they were taught the fundamentals in school, the students found procedures, techniques, materials, and at times, terminology different in an industrial setting. In spite of this, supervisors reported all Co-op students were productive within an unusually brief training period.

Upon returning to school, the students found their courses and laboratories to be more meaningful as they now have a more realistic concept of the relationship between their education and their career. Although thirty-eight of the students have received permanent job offers upon graduation, all the students plan to continue their education (on either a part or full-time basis) in the field of study in which they will receive their A. A. S. degree.

TEACHER EVALUATION

Teachers find the Co-op students to be more mature, responsive and stimulating in class. They have found that the exposure to industry has given the students broader insights, developed their confidence, and given them a more realistic approach not only toward school but to their future as well. Academic records particularly those of the Spring '70 semester are not valid in evaluating academic progress as the options given the students for final grades cannot realistically be compared to previous grades. Teachers have stated that the academic progress of the Co-op student shows a marked improvement in grades since returning from job assignments. This may also be partly attributed to the lessening of economic pressures upon the students since they grossed between $3500.00 and $5000.00 while on Co-op assignments.

CONCLUSION: The study shows a successful Co-op experience to be a definite benefit to the career student, whether he be classified as disadvantaged or not.

NEW YORK CITY COMMUNITY COLLEGE

CO-OPERATIVE EDUCATION PROGRAM

EMPLOYERS EVALUATION

Relations with others

---Exceptionally well accepted
---Works well with others
---Gets along satisfactorily
---Has some difficulty working with others
---Works very poorly with others

Attitude- application to work

---Outstanding in enthusiasm
---Very interested and industrious
---Average in diligence and interest
---Somewhat indifferent
---Definitely not interested

Judgment

---Exceptionally mature
---Above average in making decisions
---Usually makes the right decision
---Often uses poor judgment
---Consistently uses bad judgment

Dependability

---Completely dependable
---Above average in dependability
---Usually dependable
---Sometimes neglectful or careless
---Unreliable

Ability to learn

---Learns very quickly
---Learns rapidly
---Average in learning
---Rather slow to learn
---Very slow to learn

Quality of work

---Excellent
---Very good
---Average
---Below average
---Very poor

Attendance: Reg.--- Irreg.--- Punctuality Reg.--- Irreg.---

Overall rating: Excellent--- Very Good--- Average--- Marginal--- Poor---

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Comments_____

Signed_____
Company Representative

This report has been discussed with the student:

_____yes_____no_____

Final Report of Project for Summer Institute
on Disadvantaged Students

THE EFFECTIVENESS OF SINGLE-CONCEPT AND MULTI-CONCEPT FILMS IN A SELF-INSTRUCTIONAL PROGRAM IN TEACHING A UNIT IN INTRODUCTORY CHEMISTRY IN COMMUNITY COLLEGE

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The Problem:

The purpose of this project is to compare the effect of a selection of 8mm single-concept and 16 mm multi-concept films in a self-instructional program on a unit on atomic theory and chemical bonding upon the achievement of Community College freshmen with the effect of (1) lecture reinforced by films and (2) lecture method only in teaching the same unit.

Basic Hypotheses:

A. Students who are taught by a self-instructional film program consisting of a combination of single and multi-concept films will develop better mastery of the content of the unit on atomic theory and chemical bonding than students who are taught by the lecture-film method or the lecture-only method of presentation.

B. It is also hypothesized that the group taught by means of the self-instructional program will demonstrate greater retention of the materials learned when tested at the end of the semester, ten weeks later, than the group taught by the combined-lecture film method or the group taught by the lecture-only method.

Procedure:

Three classes of freshmen chemistry students were used in this project. Each class was taught the unit on atomic theory and chemical bonding by a different method as described below:

Class 1: This group was taught the unit on atomic theory and chemical bonding by means of a series of single-concept loops of about 5 minute duration each, and with two 16mm full length films of about 20 minutes duration each. The following procedures were used in teaching this group. At the start of the period the objectives of the lesson were discussed by the teacher in charge, and a full length film was shown. Following this , the students were told to read the material covered by the film in the appropriate section in their textbook. At the next meeting, the entire period was devoted to the viewing of the single-concepts and the full length 16mm films by the students. Teacher participation was minimal. The teacher acted as an advisor, and spent his time in showing the students how to run the films in the various projectors that were available.

At the third meeting the period started with a discussion of the materials presented in the films, and was followed with questions and answers until about one half of the period was exhausted. During the remaining half of the period the full length film that was initially shown at the first period was shown again as review.

At the fourth meeting, the objectives of the second lesson were discussed, another full length film was shown, and the process described above was repeated again.

Class 2: This group was taught the unit on atomic theory and chemical bonding through a structured lecture which was supplemented by only the two full lenght 16mm multi-concept films that were used by the first group discussed above, As with the first group this second group saw the films twice. Once at the beginning before the lecture, and a second time as review when the materials to be covered had been taught. This means that about three lecture hours were spend between the first showing and the second showing of one of the full length film, and the same amount of time was spent between the first showing and the second viewing of the other full length film.

Class 3: This group was taught by means of lectures only with no film reinforcement. The materials covered in the unit on atomic theory and chemical bonding was the same for the three groups and the same amount of time was spent in teaching the unit to the three groups.

Each group had received, prior to the experimental period, a pre-test consisting of 30 multiple choice questions taken from a standardized American Chemical Society (ACS) test. The questions in this test were selected in such a way that they reflected the materials covered by the films and the lectures.

Sometimes during the experimental period the three groups were given an unannounced test in order for this investigator to determine how much learning was achieved by the film program group as compared to the two other groups. The results of this test and other subsequent tests that were administered to the three groups will be discussed later. The questions in this unannounced test were also taken from a standardized ACS examination. The reason why this test was unannounced was to eliminate any factor that enters when students prepare for a test by studying at home. Since the film program will contain some materials not found in the textbook, but covered in all three groups, the result of this unannounced test should give some indication of the relative effectiveness of the film program.

A post-test was also given at the end of the experimental period. Each group was given one week advanced notice for this test. The Questions in this test covered the entire unit and consisted of a combination of questions from the pre-test and the unannounced test mentioned above. The questions however were presented in a different order. This test (post test) consisted of 60 multiple choice questions.

Finally at the end of the semester, which was the first week in January 1971, a retention test was adminitered to the three groups. This test was exactly the same as the post-test except that the questions in it were scrambled.

The scores from each of the four tests: pre-test, unnanounced test, post-test (at the end of the unit), and retention test (at the end of the semester), were subjected to a statistical analysis of covariance in order to determine whether the differences among the mean of each group was statistically significant. The level of significance that was chosen by this investigator was the 0.05 level, which is the level commonly used for studies of this nature.

The Three analysis of covariance were computed for each combination of two groups, for a total of nine analyses. The dependent variables for each of the three analyses were tested. These were test 2,3, and 4 respectively (unannounced, post-test, and retention test). The independent variable was each combination of two of the three groups. Test 1 (the pre-test) was the covariant in every case.

The above analyses of covariance are summarized below:

A. Between group 1 and group 2:

1) Analysis of covariance: test 1 and 2
2) " " " " " ": test 1 and 3
3) " " " " " ": test 1 and 4

B. Between group 1 and group 3:

1) Analysis of covariance: test 1 and 2
2) " " " " " : test 1and 3
3) " " " " " : test 1 and 4

C. Between group 2 and group 3:

1) Analysis of covariance: test 1 and 2

2) " " " " " : test 1 and 3

3) " " " " " : test 1 and 4

The calculations used for the computation of the analysis of covariance followed the format presented by Garrett.[1]

Conclusion:

The analysis of covariance established that there was a significant difference among the means of the difference scores of the three treatment groups. In order to determine more accurately which of the three groups achieved significantly better a comparison of the differences between the means of the three treatments was done using the Sheffé method. The results achieved by this method indicated that the second group (the lecture-film group) achieved significantly better than either the first group (the film program group) and the third group (the lecture-only group). The Sheffe method also indicated that the lecture-only group achieved significantly better than the film program group. However, upon questioning the students of the first and second group (the film program and lecture-film groups) as to how they enjoyed the manner in which they were taught, the investigator found that there was greater enthusiasm and interest among the film program students than among the lecture film students. In fact some students of the latter group indica-

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1. H.E. Garrett, Statistics in Psychology and Education New York: Longmans, Green & Co., 1957, 289-291

that they found the films boring or too long.The film program group on the other hand found it thrilling to be on their own, and also they kind of liked the informality and the easygoingness of the classroom atmosphere.

This investigator of course makes no conclusion as to which of the three methods of teaching is better. In fact, although the film program group did the most poorly, this investigator feels that this may be due to the fact that the novelty of the teaching presentation did ~~xq~~ create some confusion not only among the students but also to the teacher. This investigator therefore suggests that such experiment be repeated again but under more careful planning. The superficial state by which this experiment was planned ~~xhixexhxix~~ due in great part to the harassed state this investigator was in during this fall semester 1970 does not allow for any definite conclusions to be drawn from it.

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APPENDIX C

LIST OF CONSULTANTS & STAFF

1970 SUMMER INSTITUTE FOR TWO-YEAR COLLEGE FACULTY

ON IMPROVING SKILLS IN WORKING WITH DISADVANTAGED YOUTH

LIST OF CONSULTANTS AND STAFF

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48. Curtis Walton, NYC Community College, Electro-Mech Tech Student
49. Hilton A. White, President, Bushwick Community Corp.
50. Elaine Wilson, Community Guide, Bushwick Community Corp.
51. Mary Winckel, Community Guide, Bushwick Community Corp.
52. James P. Wooten, Director, Community Services, Staten Island C.C.
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